..THE IRON AGE..

JANUARY 26, 1933

ESTABLISHED 1855

Vol. 131, No. 4

Technocracy Offers Us a Gilded Stone

By JOHN H. VAN DEVENTER
Editor, The Iron Age

IN an address, here abstracted, which was delivered at the annual dinner meeting of the Rochester, N. Y., Chamber of Commerce, Jan. 16, Mr. Van Deventer put Technocracy under the white light of searching inquiry and common sense. He exploded the Technocratic claims that current unemployment has been caused by the machine, that "energy certificates" would abolish the price system and that technological dictatorship would usher in a 4-hr. day and a $20,000 income.

Human inertia cannot be banished by fiat, he declared, and Technocratic paternalism, like other forms of paternalism, would result in a sharp falling off in individual effort and efficiency. At the same time Technocracy would require a huge and costly bureaucracy for the detailed planning and supervision of the daily affairs of 125 millions of people, for checking up on the performance of assigned tasks, and for keeping account of individual inputs and outputs making up the energy budget.

Such a chimerical "plan" implies a complete parting of the ways with the past. It implies a revolutionary experiment on a grand scale with no precedents to warrant hope of success.

The premises of Technocracy are wrong, said Mr. Van Deventer. The machine is not to blame for the depression. Nor is the price system to blame. The fault lies with the heavy burdens that were imposed on the machine—overcapitalization, graft, government intrusion in business and mounting taxation, not to mention securities speculation, which transformed the stock market into "the most stupendous gambling hell" in history.

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YOU have all read and heard, during recent weeks, much about the widely advertised new social order which promises us a tenfold increase in 1929 income for half as many hours of work.

I would like to be able to tell you, tonight, just how the promised Utopia of laborless button pushing is to be reached. But alas, I am no Technocrat. I am just one of the majority of engineers in this country who still retain confidence in our present form of government, who have faith in our constitution and who believe that it is better and safer to find and correct the faults in our present social machine than to throw it away and let the theorists present us a new and untried one.

As a matter of fact, the responsible engineers of this country take no stock in Technocracy. It was "disavowed," for example, by the American Engineering Council at its annual meeting on Jan. 14. Among the paragraphs of the resolution of the Council, excoriating the methods and tenets of the new "cult" I will quote the following typical paragraph:

"These statements and conclusions may have a serious effect of undermining public confidence in our present civilization and are holding out an unwarranted promise of a quick solution of economic ills. The method of presentation has been marked by exaggerated, intolerant and extravagant claims. They have capitalized the fears, miseries and uncertainties due to the depression and have proposed a control which is, in effect, class dictatorship."

Officially, Technocracy professes to have no plan whereby our social mechanism can be revised to fit its theory of energy determinants. I have been told, however, by apparently responsible erstwhile members of the Columbia group and others familiar with the teachings of the chief Technocrat, Howard Scott, that such plans have been discussed down to such details as the method of "taking over" the reins of government, the communal housing and feeding of the workers, and the amalgamation of Canada and Mexico with the United States into a continental Soviet, operating under the findings of the "Energy Survey of North America."

Prices Cannot Be Abolished

Technocracy says that "the price system is doomed," which is another way of saying that capitalism is done for. Scott criticizes Russia, in fact, for not going all of the way and dis-

carding the price tag. Scott would substitute energy for price as the measurement of values.

The fact is that you cannot abolish price any more than you can abolish cost, so long as you intend to make and distribute things. Under any social system, even as primitive as that of barter, you must have some proportionate measure of values and this, call it by what name you may, constitutes a price.

Soviet Russia's bait, offered to the Russian public at the time of Lenin's accession to power, was a better standard of living for the masses. Technocracy's bait, dangled under the noses of the unemployed and the discouraged of America, is a 4-hr. day and $20,000 a year income.

Candidates for political office are apparently amateurs at making campaign promises as compared with the Technocrats. Ten years of Russian collectivization, by the way, have transformed Russia—transformed it from one of the principal grain exporting nations to a position where today it cannot provide even its own people with enough bread.

A Road to Dictatorship

Technocracy, while it says nothing about it, is of course incompatible with our present form of government. It is incompatible also with Socialism, according to Norman Thomas, who ought to know. It would require the abolition of the vote and of representative government, the abolition of property and the establishment of a Technocratic bureaucracy which would dictate with absolute finality the very pattern of life of the great majority.

Technocracy is not a new idea. It is not in itself a significant development. It has revealed nothing, as yet, that the well informed engineer was unaware of except that public credulity increases rapidly in times of distress. To a drowning man, even a doughnut looks like a life preserver. Its real significance lies in the public interest which it has created and which is due to a chain of circumstances. These are the present depressed condition of industry and employment, the fact that the general public regards Columbia University as being "back" of Technocracy, the public's belief that its pronouncements are those of a representative and responsible body of engineers and the fact that it received the impetus of an introduction to the general public through Ex-Governor Alfred E. Smith's *New Outlook*.

Offers a Gilded Stone Instead of Bread

If Technocracy would work, if there were a possibility it would fulfill one-half or one-quarter of what it promises, I should be for it heart and soul. The unfortunate thing about it is that it cannot work and that its spokesmen are arousing false hopes in the hearts of victims of the depression which are bound to bring sad disappointment.

The public is asking for bread. Technocracy offers them a gilded stone.

Columbia University has no official connection with Technocracy, although it would be hard to get the public at large to believe this fact. Scott and his associates were invited to make use of vacant space at Columbia by Dr. Walter Rautenstrauch, professor of industrial engineering at Columbia and one of the small Technocratic group. Scott was introduced to Dr. Rautenstrauch as a "doctor" who had several degrees from universities overseas, as a former chief engineer and technician of the Muscle Shoals project and as an engineer with a long record of notable accomplishments. This introduction was accepted without question. Later, as you may possibly know, it developed that all of this was untrue.

Aim Is Overthrow of Present System

Scott is known to have held communistic views for many years. In the depression of 1921 he made a similar prediction to the recent Technocratic threat of general chaos in 18 months, except that he then gave capitalism a limit of two years to live.

Scott and his followers are outspoken in their belief that our present social system and form of government must be discarded and replaced by what amounts to no more nor less than communism under a technological dictatorship. They are not interested in finding ways and means to take the squeaks and rattles out of our present machine. They want to throw it on the scrap heap and then start to build us a new one.

Gross Distortion of Facts

It is unfortunate that Columbia University should have permitted itself to become associated, in the public mind, with a movement having such obvious intentions. The host cannot disclaim responsibility for the conduct of its guests. Freedom of discussion is, of course, a cardinal principle of our universities, but it is not compatible with ballyhoo, concealment of evidence or distortion of facts. One might ask why Columbia does not afford equal hospitality, publicity and prominence to an organized research directed toward constructive improvement of society under capitalism and led by those who are not congenitally opposed to it.

One may truthfully say that practically all of the supposed statements of fact in the fragmentary supporting data used in Technocracy's announcements as the basis of its conclusion are in serious error. The examples given by Wayne Parrish in the *New Outlook* regarding productivity in different industries constitute what is probably the highest average of misstatement of facts as yet attained in any serious publication. The same criticism applies to many of the factual statements made by Scott and others of the group. What is said by them regarding pig iron, steel, iron ore, textiles, incandescent lamp manufacture, brick making, agriculture, etc., exaggerates the actual facts by anywhere from 30 to 300 times.

The Technocrats claim that the machine is improving so rapidly that it is obsolescing our social system, the critical symptom being technological unemployment.

Since the beginning of our intensification of machine development in America up to and into the depression year of 1930 there has been no such thing as permanent technological unemployment. On the contrary, there has been a gradual increase in individual working opportunities. Instead of causing unemployment, the machine has caused increasing employment—at a rate faster than our increase in population.

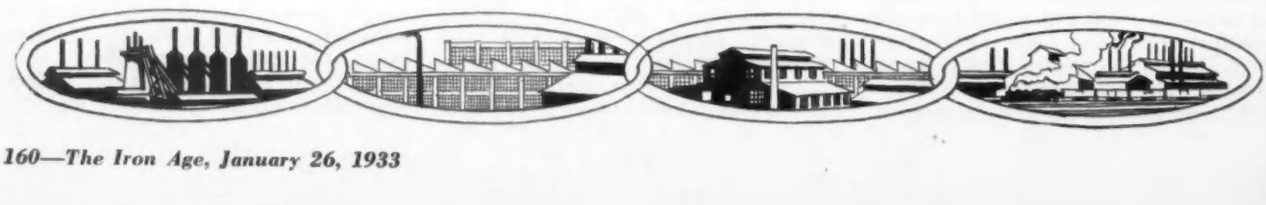
The present abnormal unemployment condition can be by no means ascribed to technological displacement. If it were we would find our machines busy and our men idle. The reverse is more nearly true. Against an average out-of-work estimation of 20 per cent for our wage earners, as given by the American Federation of Labor, we have an average out of work of more nearly 50 per cent for our production equipment. Our machines, in these abnormal times, have experienced more unemployment than have our human workers.

From the beginning of our intensive "machine age" in 1880, up to 1930 the record shows conclusively that the machine, under its present ownership, has increased and not diminished the density of employment.

These indisputable figures which come from our census statistics effectively disprove Technocracy's chief threat and show the discrepancy between academic theory and practical fact.

"Academic Nursemaids"

One might ask how such distortions of fact could possibly be made by intelligent men. In my opinion it is because they are venturing beyond their depth. Of the small handful of



men who constitute the inner circle of Technocracy, we find no lack of brilliancy but little first hand experience in the management of industrial enterprise.

President of the National Industrial Conference Board, Dr. Virgil Jordan, characterizes them as "academic nursemaids," who are attempting to lead us by the nose. When you befuddle even a brilliant academic mind with the acceptance of a theory based on mathematics "more complicated than that of Dr. Einstein," you are likely to find it leading you into mazes of pure speculation and away from demonstrated fact.

Dr. Butler, of Columbia, states that he is reserving judgment in the matter of Technocracy. He refers to the "energy survey of North America," now being made under Technocratic direction at his university, as being something "that must be considered."

Energy Not a True Measuring Stick

That is true. One thing to be considered is whether it is being conducted to reveal actual facts or to substantiate a theory. Another is whether energy, as represented by power resources and expenditures, is a basic indicator of values. The latter consideration is the more important, of course, since Technocratic philosophy hinges upon it.

The skilled diemaker or engraver may work for hours to produce a single die or a hand-engraved piece of silverware. In so doing, he may have expended far less energy than is required by the drop hammer operator to rough out the front axle forging for a Ford car. Shall we abandon skill and time as components of value in favor of mere horsepower? It probably required less expenditure of calories to write the New Testament than it does to make 100 kegs of tenpenny nails. Does that establish a relative measure of worth?

Technocracy does not make itself clear as to whether it proposes a medium of exchange, although there has been something said about the use of energy certificates. If the price tag is completely abandoned and there is no exchange medium whereby one may exchange services for goods how would it be determined who would get the porterhouse steak or the 12-cylinder car and who would get the rump steak and the "flivver?" Of course we might make nothing but 12-cylinder cars of the deluxe model —that is a possibility. But it is hard to see how we could persuade the cows to give only porterhouses.

Energy Certificates Would Not Eliminate Prices

If energy certificates *are* to be used as a medium of exchange, they could be used but in one of two ways. If they are not to have general circulation, but are to be "one-way tickets," they would have to go direct from the user to the merchandise depot and thence to the general central energy certificate bank for cancellation. Naturally this would require an unthinkably enormous accounting force to keep track of individual debits and credits. The alternative is to permit them to circulate, the same as we do money, in which case you get right back to the price tag again and you once more encounter all of the possibilities of graft, theft, speculation and individual aggrandizement which Technocracy is supposed automatically to make impossible.

The Technocrats who so facilely dangle the bait of a tenfold increase in average income in exchange for a 4-hour work day before a gullible public, do not tell us just how long it would take to reach this promised El Dorado. They take no account of the tremendous increase in cost of government required for the detailed planning and supervision of all of the details of the lives of 125 millions of people, or of the elaborate accounting methods needed to check up on the performance of the assigned tasks, or to keep tabs on the individual inputs and outputs making up the energy budget. They make no allowance for the sharp falling off in individual effort and efficiency under a Technocratic paternalism or any other paternalism in which no man need fear the loss of his job, be he worker or shirker. They take no account of the fact that human inertia cannot be banished by fiat; that if you can perhaps demonstrate an efficiency of 98 per cent of theoretical in an isolated case, this becomes possibly 90 per cent when applied to a group of ten cases; 80 per cent when applied to a group of 100 and possibly 50 per cent when applied to 10 000 cases. They take no account of the fact that the training and fitting of the tens of thousands who as salesmen or others now make their living in occupations that would vanish under Technocratic bureaucracy would make their theoretical production efficiencies melt like snow under the contents of a tea kettle.

COMMENCING in the Feb. 2 issue of THE IRON AGE, Walter S. Giele will present a series entitled "What the Machine Has Done to Us and for Us."

We regard this series as epochal in the annals of business publishing. While it deals exclusively with known and indisputable data, it develops relations between the factors of mechanization, the application of power, productivity, wages, employment and the status of the wage earner which have not been previously recognized. What is perhaps more important, some of these relations are contrary to what has generally been believed to be the case.

Every thinking man in the metalworking industry, where mechanization has been most intense, will be vitally interested in the facts to be presented, for upon these facts must be built the future of the mechanical industries and of the men engaged therein.

The author does not indulge in either speculation or in higher mathematics in the presentation of his findings. His findings are based upon simple successive steps which may be checked by any reader. Those who follow this series in the succeeding numbers of THE IRON AGE will be able to think and speak with more authority and sureness in planning for the future, because they will have obtained a clearer picture of what the machine has done to us and for us.

Laboratory Test Should Come First

Why is it that social experimenters, unlike their more scientific brothers of the physical and chemical laboratories, instead of demonstrating the feasibility of their schemes on small quantities, always want to try it out on entire populations? In self defense it would seem good business to set aside the Virgin Islands or some other remote sanctuary as a sociological laboratory where reformers who could comply with the requirement of submitting a feasible blue-print could in turn be afforded opportunity to demonstrate their performance before attempting to run all of the raw material in sight through their new machine.

It would not be hard, for example, to sell the rest of us the idea, once we saw a million or two people working 4 hrs. a day and getting $16 an hour for it.

Needed: Repairs Not Reconstruction

If you are crossing a desert in an automobile, your car may stop completely because of lack of oil in some small internal bearing. Unless you know what is the matter and how to fix it, this plugged up oil hole, representing a one per cent defect in a machine otherwise 99 per cent perfect is as serious, so far as your getting out of the desert is concerned, as if your machine were 100 per cent ready for the scrap heap. If you are a wise man, under these circumstances, you will not abandon the machine which has carried you, even with many unpleasant bumps and squeaks from where you started to as far as you have gone. You will not sit down upon the hot sands and attempt to evolve a new and better automobile. If you do, you will probably starve to death before you have much of it completed. No, if you are wise, you will begin a thorough search for the defective part, and if you go about it systematically you will be sure to find it. Then you can clean out the plugged oil passage and start on your way again.

That, it seems to me, is what we ought to do with our present stalled economic machine. It has taken hun-

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American Automatic Machinery Aids Soviet Reconstruction

By RALPH E. MILLER

THE general economic policy of Soviet Russia contemplates industrial construction that will not only support the needs of large-scale mechanized farming but will make the country as self-sufficient industrially as possible. Machine building is regarded as basic to the accomplishment of this tremendous task, and hence conspicuous effort has been made to build and equip plants at strategic points for the production of machinery and metals.

Farm implements are perhaps of special importance at the present stage of development, because of their close connection with the general problem of agricultural reconstruction, which, of course, is basic.

Tractor Manufacture Being Pushed

Within the agricultural implement industry, effort has been concentrated particularly on the building of farm tractors. According to publications of the Amtorg Trading Co., New York, about 2100 tractor stations, maintaining about 71,530 tractors, have already been established to serve collective farms aggregating some 87 million acres. In addition, the State farms employ about 58,000 of the machines, making in all about 130,000 tractors now in farm use.

As to tractor manufacture, three large plants have been completed, and a fourth, at Cheliabinsk, is expected to be ready early next year. The annual capacity of these four plants is 175,000 machines. In addition, it is planned to produce tractors in certain other existing shops erected chiefly for other products.

Mass Production Methods Followed

As many American machine tool builders know from the machines and tooling ordered for shipment to Russia, the Soviet program contemplates the utmost use of mass production methods. Production is in lots to standard designs, with parts made to limits that will assure interchangeability. Continuous improvement in quality and a progressive lowering of production costs (by 35 per cent by the end of the 1928-33 five-year plan) are also definitely called for in the machine-building plans.

At bottom of this type of production is the automatic machine, with its high output, accuracy and labor-saving—advantages not overlooked by Soviet engineers. In lathe operations, for example, wherever the work will permit, full use is made of multiple tooling, in which a large number of tools cut simultaneously. Such machinery also reduces to a minimum the number of skilled mechanics needed. Obviously, this is especially advantageous where there is a relative shortage of skilled workers.

Examples at hand that reflect concretely the Soviet production program are the Fay automatic lathes furnished recently by the Jones & Lamson Machine Co., Springfield, Vt., for machining the motor cylinder, pistons and sprocket shaft and other parts of the No. 60 Caterpillar-type tractor to be built at the Cheliabinsk plant. The complete order called for 47 machines, the last of which were shipped Nov. 14, 1932.

Tractor Cylinders Machined on Automatics

For the engine cylinders, two 14 x 33-in. Fays with standard sliding gear transmission will be used, one for roughing and the other for finishing. The machines are being furnished complete, including all tools and fixtures, motors and push-button control.

The cylinders are single gray iron castings weighing about 75 lb. After being rough-bored to a limit of 0.020 in. on a vertical boring machine, they are delivered to the first Fay automatic, which is tooled to rough-face and turn the outside of the casting, including straddle-facing of the ends.

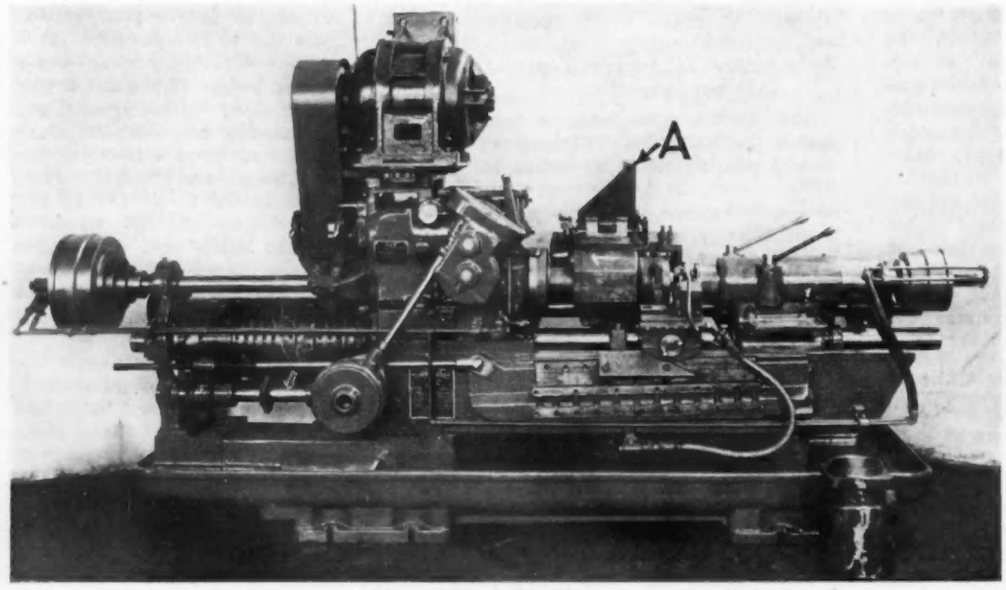


FIG. 1.—One of several American automatic machine tools ordered for the Cheliabinsk tractor plant recently completed by the Soviet Union. This and a companion Fay lathe will be used on cast iron engine cylinders which weigh about 75 lb.

This machine shown in Fig. 1, is equipped with special air-expanded collet-type fixtures on both headstock and tail-stock for supporting and driving the work. The piece is located from the rough water-jacket hole *C*, Fig. 2, by means of a locating pin in the gaging arm mounted on top of the back arm tool block, as shown in Fig. 1 at *A*. This gaging arm is counterweighted so that when the operator releases it, the arm swings away from the work automatically.

Seven tools are employed. Tool No. 1 (Fig. 2), mounted on the front carriage, turns a projection of the cylinder that extends down into the crankcase, this diameter being held to 0.002 in. Tool No. 2 chamfers the hole in the flanged end of the cylinder casting, and tool No. 3, which is mounted in a swinging block, chamfers the hole in the head end.

Cylinder Production Exceeds 20 Per Hour

The back arm, *B*, Fig. 2, carries four facing tools, the first of which (No. 4) faces the head end of the piece. This tool is required to make interrupted cuts, because of a number of water-jacket holes in the head end of the casting. Tools Nos. 5, 6, and 7 face the rectangular flange which attaches by bolts to the crankcase.

A 20-hp. 1000 r.p.m. General Electric motor drives the first-operation Fay automatic. With an idle time of 0.10 min., a work-changing time of 0.50 min., and an allowance of 0.56 min. for extras, the average time per piece for a day's run is 2.82 min. This

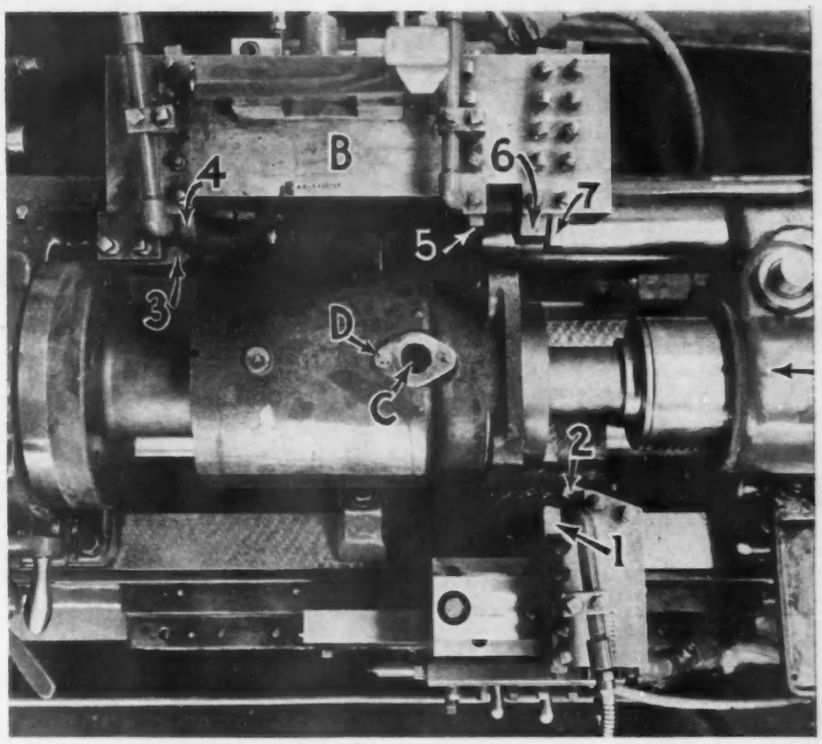


FIG. 2.—In the first operation the engine cylinders are rough-faced, turned on the outside and straddle-faced at the ends. Seven tools—either tungsten carbide or stellite—are employed, and the first operation production is at the rate of 21 pieces an hour.

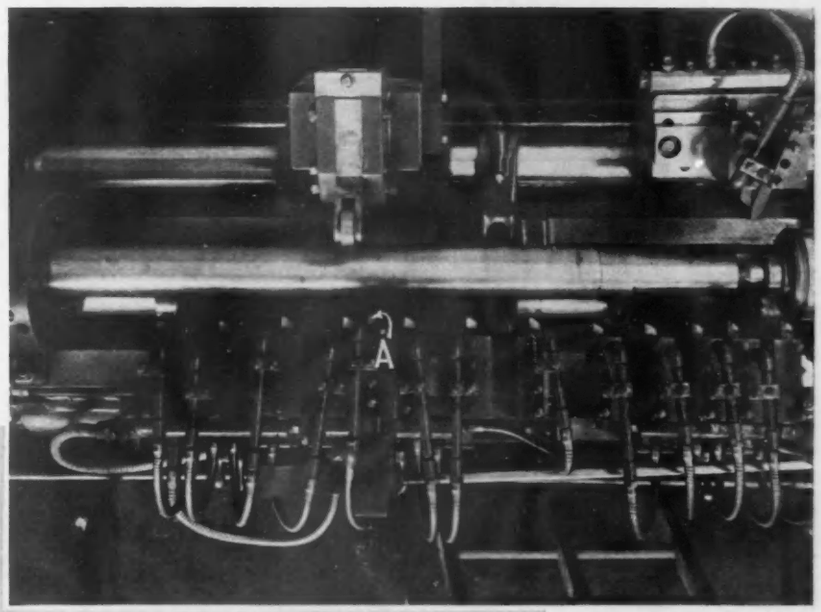


FIG. 3.—(Below) Rough sprocket shafts that are approximately 47 11/16 in. long are roughed and finished at the rate of five shafts an hour. Fifteen tools are employed in the first operation and 14 in the second. The shaft is made of S.A.E. 2345 steel.

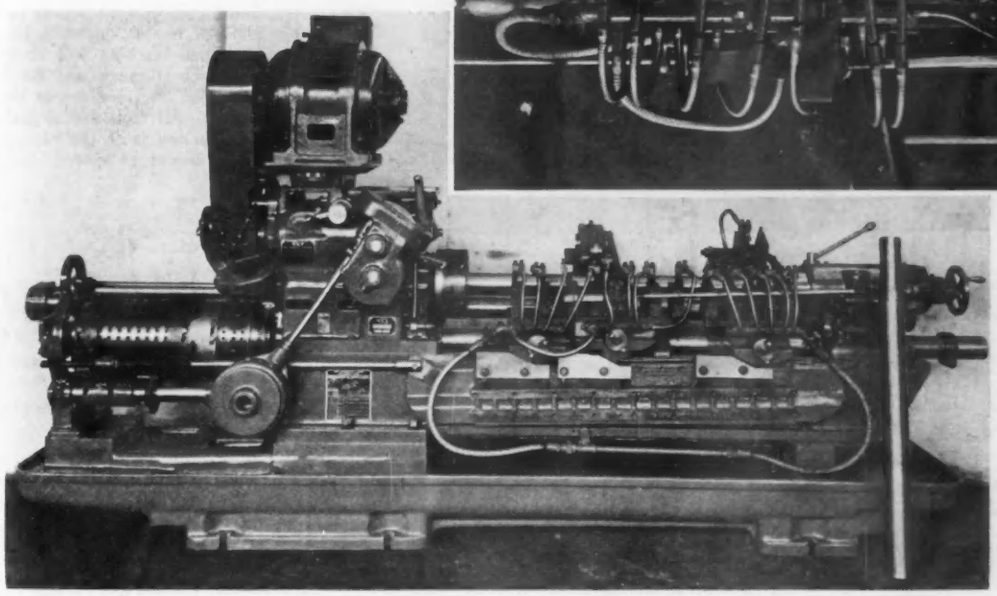


FIG. 4.—(Above) The rough sprocket shaft is mounted between centers and driven by a two-jaw eccentric driver. After Tool *A* has turned a spot on the shaft, the steadyrest is brought into contact with the work and the front carriage tools rock in and rough-turn the shaft. During the turning, the end of the shaft is faced and chamfered.

gives a production of 21 pieces an hour.

The rough-turned and faced engine cylinder next goes to a second vertical boring machine, which finish bores the cylinder hole to limits of plus or minus 0.001 in.

Finishing operations on the second Fay automatic are the same as the roughing except that chamfering is not included. The air-operated headstock and tailstock fixtures and the locating arm are similar to those of the roughing machine, but in the finishing operation the rough cylinder is located from one of the tapped holes on the water-jacket boss, as shown approximately at *D*, Fig. 2. A 15-hp. 1000-r.p.m. motor drives this machine. Average time per piece, allowing for idle time, changing of work and extras, is 2.55 min., giving a production of 23 pieces an hour.

One man will operate two machines. Both lathes will be equipped either with Stellite or cemented-carbide-tipped cutting tools.

Sprocket Shafts Machined Rapidly

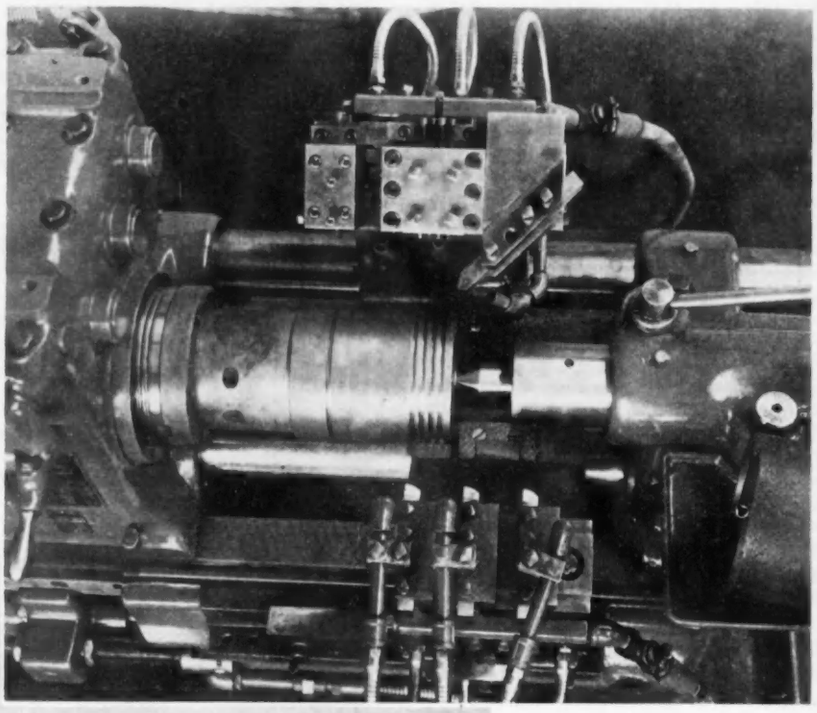
For rough and finish turning of the sprocket shafts, the Soviet plant will use two 14 x 50-in. Fay automatic lathes. This shaft is made of S.A.E. 2345 bar stock having a Brinell hardness of 229 to 255. Before machining, the bar is cut to length, stock being allowed on both ends for facing on the Fay operations. Both ends are also centered.

The rough shaft, which is approximately 47 11/16 in. long, is carried between centers and driven by a two-jaw eccentric driver. The tailstock center is mounted on ball bearings in a 6-in. diameter screw-operated ram. Tool *A*, Fig. 4, mounted on a profile turner, first turns a spot on the shaft. When this spot is finished the tool drops away and the steady-rest, equipped with two ball-bearing rolls and mounted on the back arm as shown, is brought into contact with the shaft. The front carriage tools then rock in and rough-turn the shaft. During the turning the tools shown at the right on the back arm face and chamfer the end.

When all cuts are finished the machine goes into fast motion and the carriage and back arm move away sufficiently to facilitate loading. The turning tools are relieved at the end of their cuts so that they will not score the work on the return stroke.

In the finishing operation the shaft is again "spotted," to remove any run-out from the roughing operation, and then the carriage tools rock in and finish-turn the shaft. The right-hand and left-hand back arms face and chamfer the end and finish the shoulders, assuring uniform shoulder lengths.

Production of five pieces an hour is obtained on both operations.



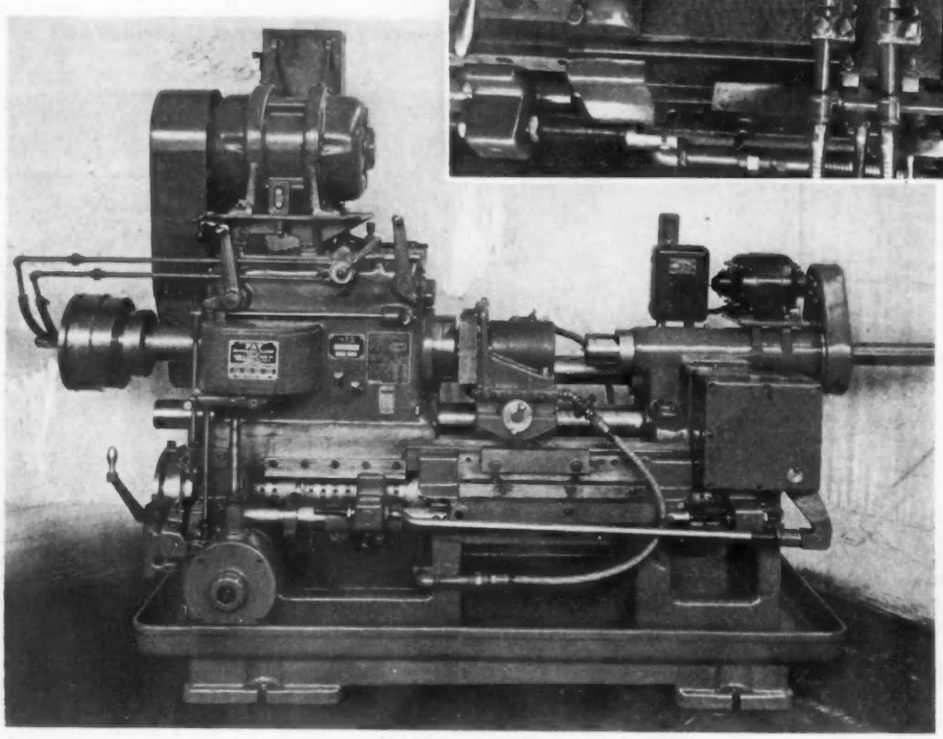


FIG. 6.—(Above) The second-operation automatic is tooled to rough turn, rough face and rough groove the piston, which is supported in the open end by a pilot. Hourly production in this and the next operation is 16 pieces.

FIG. 5.—(At left) New 12-in. Fay automatics are employed for machining cast iron pistons at the Cheliabinsk tractor plant. This first-operation machine will rough and finish bore, rough and finish face the open end, and center the closed end. All tools are of stellite. Production is at the rate of 72 pieces an hour.

For machining pistons at the Cheliabinsk tractor plant three 12-in. high-speed Fay automatics have been furnished. These machines, introduced last year, differ in some respects from the previous Fays. All sizes except the smallest, the 15-in., have two cam drums, one under the headstock and one under the tailstock. Tool movements are obtained through the back bar and center bar, as before, but the bars are operated by cams all

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Practical Methods for Heating Solids by Induction

By Dr. E. F. NORTHRUP,
Vice-president, Ajax Electrothermic Corpn.,
Trenton, N. J.

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A PRACTICAL method of heating solid metals by electric induction is described by the author, who is a recognized international authority on electric induction furnaces. The new process is intended for use in annealing, normalizing or forging. It is an extension of principles applied by the author in the successful development of high-frequency induction furnaces for melting metals. This article and one to follow represent an abstract of a paper presented by the author before the Pittsburgh district section of the Association of Iron and Steel Electrical Engineers, Jan. 14. In the concluding article reference is made to present applications of inductive heating in the manufacture of razor blade steel and chromium-plated tubes.

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IN the industries, metals and alloys of numerous kinds and of varied size and shape are heated below their melting point for annealing, normalizing or forging. At some stage in their fabrication practically all metals and alloys, which are not directly cast from the molten condition into final molds, require this reheating, often to a temperature but little under their melting temperature. We shall endeavor to explain under what conditions and by what means and apparatus this may be accomplished using electric induction in a manner to meet technical and economic requirements.

When inductive heating is employed it is important to consider whether the product to be heated is magnetic or non-magnetic. If a ferrous metal or alloy is to be heated under its decalescent point, the current and equipment needed will be quite different, in general, from what is required when the final temperature is carried above the point where magnetism is lost. All non-ferrous metals and alloys of similar form and size may be treated inductively in much the same way.

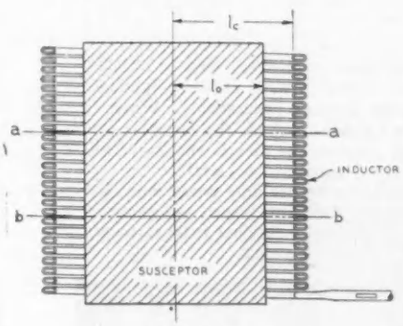


FIG. 1A

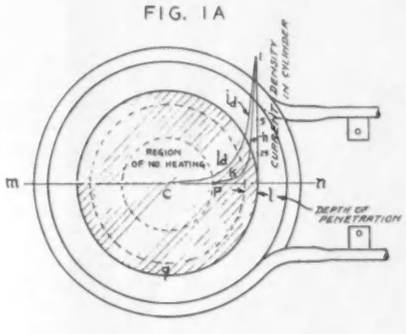


FIG. 1B

Scheme for inductively heating a solid right cylinder of non-magnetic metal. The coil is the inductor and the mass to be heated is the susceptor. A is the vertical and B the horizontal section.

Principles Underlying Inductive Heating of Solids

SIMPLE diagrams and physical concepts lead us rapidly and directly to an understanding of how non-magnetic solids may be heated by induction effectively. We first consider the simple and often common case in which a solid right cylinder of non-magnetic metal is to be inductively heated by a single layer coil which surrounds it. We shall refer to the coil as the "inductor" and shall term the mass to be heated the "susceptor." In Fig. 1A is shown in vertical section, and in Fig. 1B, in horizontal section, a typical case of this kind.

In general, the inductor would be made as a single layer coil. Round or flattened copper tubing which carries both current and cooling water is used.

When the inductor carries direct current, the magnetic field is sensibly uniform inside the inductor except near the ends, where the lines of force fan out. To simplify our considerations, let attention be focused upon the zone included between two parallel planes, a-a and b-b, taken unit distance apart and at right angles to the common axis of the inductor and susceptor. (Fig. 1A) We may then treat the magnetic field in this region as quite uniform. Since the susceptor is assumed as being entirely non-magnetic, the distribution of the field, with direct current in the inductor, is undisturbed by inserting the susceptor in the inductor.

If the current in the inductor is alternating and there is no conducting matter within it, the field is still uniform even when the frequency of the current is moderately high.

At this point the author considers the more important phenomena manifested when a susceptor, in the form of a solid non-magnetic metal cylinder, is placed inside the inductor and discusses phases of the electrical laws and phenomena involved.

Non-ferrous, non-magnetic metals and alloys which require to be heated

(Concluded on Advertising Page 14)

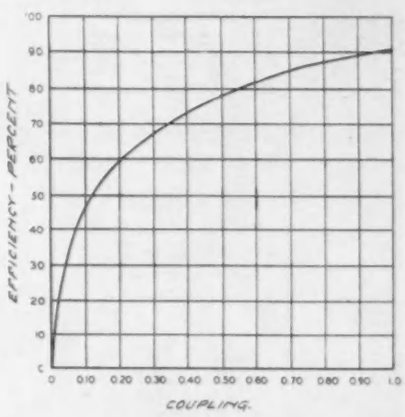


FIG 2

Increase in the overall efficiency of the heater as the coupling is varied from 0 to 1.

Ford Draws Own Wire at Rouge Plant

◈ ◈ ◈

IN the production of four-cylinder and V-8 motor cars the Ford Motor Co. uses approximately 400 miles of wire a day. From 500 to 600 Ford parts are made of wire, the more important of which are wire wheels, brake rods, carbureter adjusting rods, front brake housings, spark and gas control rods and all bolts and rivets.

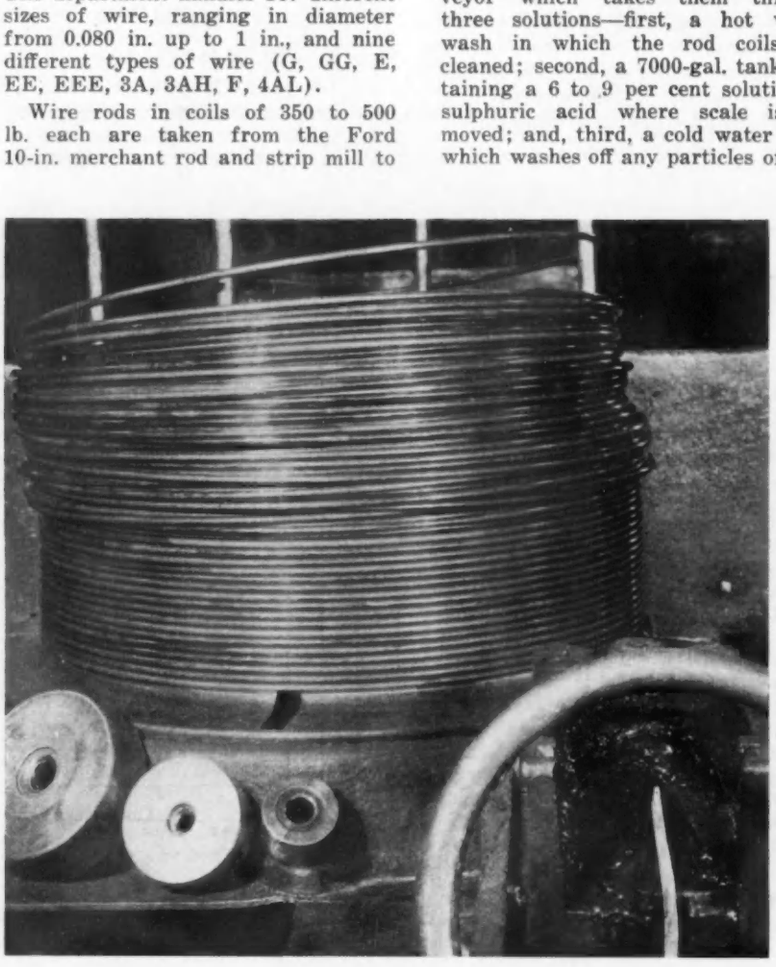
In order to have its own source of supply of this material the company now has a wire drawing department at its Rouge plant at Dearborn, Mich. This department not only draws wire, but also makes different shapes and sections, such as those used for the spare wheel tire support, the hood hinge retainer bracket and the windshield corner frames. In many cases the allowable tolerance in manufacturing these products is only 0.004 in. The department handles 147 different sizes of wire, ranging in diameter from 0.080 in. up to 1 in., and nine different types of wire (G, GG, E, EE, EEE, 3A, 3AH, F, 4AL).

Wire rods in coils of 350 to 500 lb. each are taken from the Ford 10-in. merchant rod and strip mill to a large storage room on a mezzanine floor above the wire drawing department. The storage room and a part of the wire drawing department are served by a tramway conveying system suspended by monorail from the roof of the building. Two cabs, from which hang special carriers known as wire booms, take the rod coils from stock to the floor of the wire drawing department, where they are delivered on to so-called buggies. Each carrier holds 12 coils and each buggy nine coils. The buggies are then pushed by hand along a short track to the pickling conveyor.

This continuous type conveyor has a double chain of 28 aluminum bronze "hairpins" weighing 500 lb. each. Rod coils are removed from the buggies by a two-ton overhead electric crane and placed on the pickling conveyor which takes them through three solutions—first, a hot water wash in which the rod coils are cleaned; second, a 7000-gal. tank containing a 6 to 9 per cent solution of sulphuric acid where scale is removed; and, third, a cold water rinse which washes off any particles of acid remaining from the sulphuric acid bath. The sulphuric acid tank can treat about 300 tons of rods every 24 hr. and is recharged three times a week. It is 24 ft. long and four hairpins spaced 4 ft. apart on the conveyor are constantly in the solution, which is maintained at a temperature of 160 deg. F. An inhibitor is added to the solution to prevent over-pickling of the rod.

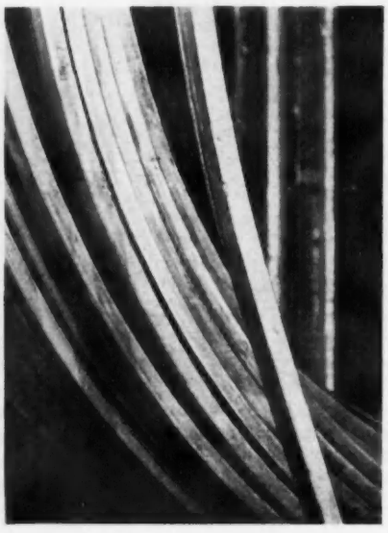
From the cold water rinse the rod coils, still on the hairpins, move up on to a sull coating rack, being sprayed with the solution so that enough residue collects to make the material easy to draw. At this point the hairpin containing rod coils is picked up by a 2-ton overhead electric crane and dipped in a lime solution so as to neutralize any acid which might be present and to prevent further oxidation. The crane then lifts coils on to a buggy which is pushed by hand a few feet to a 5-ton electric tractor truck. This truck then delivers the coils to the wire drawing machines.

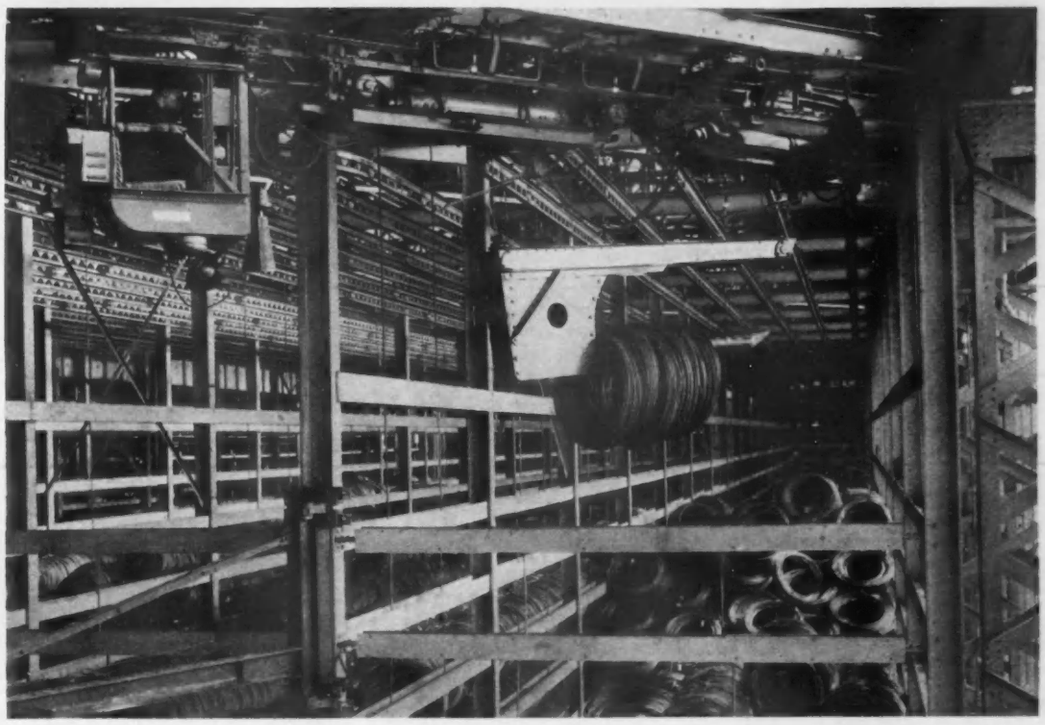
For the drawing operation there are nine swaging machines for point-



IVORY soap powder, as well as ordinary beef tallow, is used as a die lubricant for the drawing operation. When a bright finish is desired, the latter is preferred. Notice the dies in the lower left corner. (At left)

The department not only draws wire, but also makes different shapes and sections, such as the hinge retainer bracket shown below.





A TRAMWAY conveying system suspended by monorail from the roof of the building serves the room where coils of wire rods are stored and also a portion of the wire drawing department.

ing the wire and 18 drawing machines (15 vertical and three horizontal) which reduce the wire an average of 20 per cent of its area. Governed by rheostat control, the machines have a maximum speed of 500 ft. of wire a minute and a minimum speed of 350 ft. a minute. Each machine is operated by a variable-speed, 750-r.p.m., individual motor ranging from 40 to 70 hp. The swaging machines are individually motor-driven, the motors varying in capacity from 7½ to 15 hp. The floor wire reels are of the heavy type. The department is equipped with nine stripping cranes to strip the wire from the blocks after the run.

After wire is tied and tagged, it is loaded on to a truck, which holds 40 to 50 coils, to be taken to the stock room by an electric lift truck. The loading and transporting of this material is handled by one man. The department generally carries a stock of 12,000 to 15,000 coils ready to be moved on short notice to whatever manufacturing department needs it.

The wire coming from the blocks usually is tied in 150-lb. coils for convenience in handling, but for some jobs a complete billet of 500 lb. is run. The tagging process includes the stamping of the size of wire and the number of the rolling mill heat.

For certain types of work wire is being drawn successfully through tungsten carbide dies, the average life of these dies being 350 to 400 coils, although a few have run as high as 2,000,000 lb. of material.

Ivory soap powder, as well as ordinary beef tallow, is used as a die lubricant for the drawing operation. When a bright finish is desired, the latter is preferred.

Occupying 12,000 sq. ft. of floor space in the steel mill building, the department has the capacity to make 500 to 700 tons of wire a day, employing about 125 men per 24 hr. to turn out this amount of material.

FINISHED wire is taken to the stock room on a trailer pulled by an electric tractor truck. The loading and transporting of the material is done by one man.

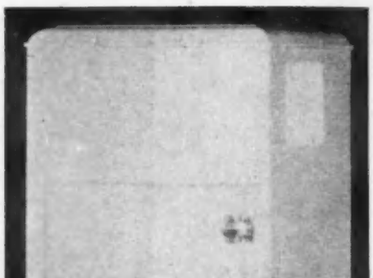
Rust-Proofing Refrigerator Parts

THE home-made ice cream of 20 years ago was usually made in a White Mountain freezer. The Maine Mfg. Co., then of Fairfield, Me., and now of Nashua, N. H., came into existence more than 50 years ago as the manufacturer of this home freezer. Since then the company has become an important manufacturer of refrigerators, and its production of this article up to the present time has exceeded two million units.

The company moved to its present location in 1895, to secure better shipping facilities. The plant has gradually extended until at present it covers approximately 30 acres and is equipped with modern straight-line production machinery.

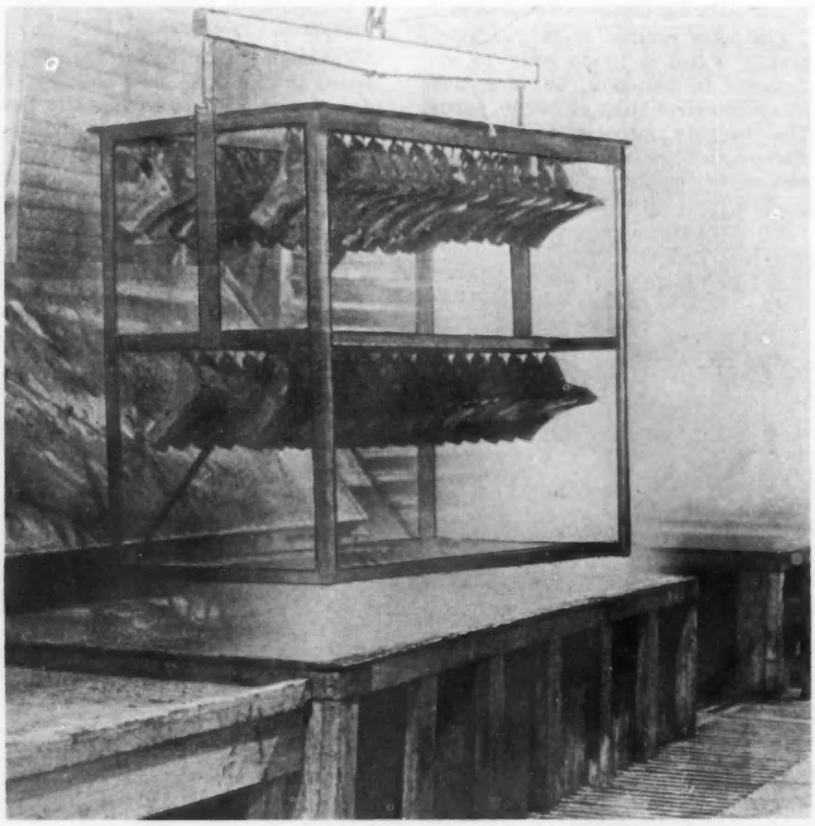
Rust-proofing of the different parts which enter into the construction of a refrigerator was one of the early problems which the company had to solve. Development in this direction has led to the Bonderizing of all metal surfaces. This operation not only rust-proofs the metal, but, in the case of parts which are to be enameled, it leaves a slightly absorbent surface, which gives a more permanent bond between the enamel and the metal. The company claims that this has effectively eliminated all peeling or cracking.

In the illustration, refrigerator legs are being put through the Bonderizing process. The parts are hung on the hooks of an angle iron frame, which is then immersed as a unit in the different baths. The sequence through this process is as follows: First, the parts are thoroughly washed and dried; then they are carried through a spray of caustic solution and then a hot water rinse. The entire washing and drying takes about 20 min., and the actual immersion in the Bonderite solution takes from 7 to 10 min. After this the parts are dipped once or twice in an adjoining tank for a final hot water rinse, and then are sent either to the assembly department or to the enameling room, as the case may require.



THIS shows an enameled White Mountain electric refrigerator made by the Maine Mfg. Co.

The officers of the Maine Mfg. Co. are: Philip E. Stevens, president; Isaac B. Stevens, vice-president; Francis H. Maaz, secretary.



Parts to be rust-proofed are dipped into a Bonderite solution and then rinsed in hot water.

Quenching in Making Japanese Cutlery

A study by Seikichi Sato of a method of quenching that has been practiced in connection with Japanese cutlery, is reported in Science Reports, of the Tohoku Imperial University, Sendai, Japan. The practice, it appears, has been to face the surface of the specimen to be hardened with a mixture with water of "tonoko", a very fine powder of a razor whetstone, and to dry the specimen prior to the quenching operation. This process is said to be indispensable to obtain perfect hardening. Since "tonoko" is powdered clay slate and a bad conductor of heat, a coating of this material, even though a very thin layer, may at first be thought to have the effect of preventing the quick cooling of the specimen. An investigation proved the velocity of cooling is much greater in the case of a faced than in that of an unfaced specimen, and that the slow cooling in the latter case is caused by the vapor film which forms on the surface of the specimen during the first period of immersion in the cooling liquid.

Putting the Question Mark to Work

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—77—

Eliminating Pickling

Is there any way that we can avoid the necessity of pickling after heat treating?

F. T. P.

BY using copper flash strip steel in the manufacture of files we have found that oxidation during heat treating is sufficiently eliminated to make pickling unnecessary. After hardening in a standard salt bath solution and tempering by hot plate the oxidized copper is removed by immersion in a 20 to 30 per cent hot sodium cyanide solution. This does away with the usual practice of removing scale with an acid pickle.

W. L. H.

—78—

Nitrided Malleable Castings

Can you tell me where to buy nitrided malleable castings? I understand these have unusual wearing qualities.

W. L. H.

PARTIAL success has been achieved by the Arcade Malleable Iron Co., of Worcester, Mass. Since the casting difficulties concerning the sand casting of gray iron are nearing solution, there is no doubt but that nitridable malleable castings will be made and marketed in the near future.

The Nitralloy Corpn.

—79—

Asphalt Coated Sheets

Is there a corrugated steel sheet with better appearance than the usual galvanized sheet and yet with equal resistance to corrosion?

C. W. A.

SEVERAL good weather-resistant steel sheets other than galvanized are obtainable. One of these is coated while hot with a special high-grade asphalt, resulting in a sheet which for some uses may have a better appearance than galvanized, and which it is claimed compares favorably in price and durability with the usual galvanized sheet.

A. S. B.

—80—

System for Reheating

Can you recommend a fuel oil system for a reheating furnace in a rolling mill?

C. S. B.

DEPENDING upon the type of fuel oil used, such an oil system would vary in its essential characteristics. Assuming that for economy's sake a heavy grade of oil is to be used, the storage tank should be equipped with heating coils of sufficient capacity to keep the oil at a temperature of 100 deg. F. The oil should be withdrawn from storage by a motor-driven rotary pump, piped to the point of consumption, and passed through a secondary oil heater preferably thermostatically installed just before the first burner branch line is taken off. After passing various furnaces to be fired, the oil is circulated through a pressure relief valve and excess oil returned to storage. The type of burners used might be mechanical, steam atomizing, or air atomizing, either high or low pressure. Low-pressure air atomization would probably be the most economical under average conditions. The temperature at which the oil should reach the burners would, depending upon the type of burner and kind of oil, be from 160 deg. F. to 200 deg. F.

Sun Oil Co.

CHECKING OPERATION COSTS

ARE your machine tools producing as much as they should? Have you taken advantage of the new cutting materials? Are you burning more oil in your furnaces than necessary? Are you working inefficiently because of poor light? Answers to these questions and many other similar ones may be had by watching the comments of many authorities presented on this page. Please send your questions or comments to the Forum Editor, The Iron Age, 239 West 39th St., New York

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—81—

Good Light Pays

What intensity of illumination should be used at the tool operation level in a general machine shop?

E. O. H.

THE intensity of illumination in machine shops has been gradually increasing during the past few years. It was not long ago that an intensity of about 12 ft. candles was considered good practice. Now several modern plants have been designed with illumination close to 20 ft. candle intensity. One plant has painted nearly all interiors with a bright aluminum paint, and by this means has increased intensity of light at the machines to close to 20 ft. candles, and reports an improvement in quality and production.

R. B. K.

—82—

Judging Forging Temperature

How can I determine the proper forging temperature from the analyses of various steels and steel alloys?

L. O. D.

IN most cases the question of proper forging temperature for a given chemical analysis of steel is answered after years of experience through forging that particular grade of metal. We do not have any tables covering this, but believe that the best place to get them would be directly from the steel companies supplying the steel. In our own case on any metal we are not familiar with we ask the mill for forging temperatures and heat-treating information in order that we may be sure the steel will be handled properly. The steel people are always glad to give this information.

Moore Drop Forging Co.

—83—

Low Expansion Alloy

Do you know of a steel alloy having a low coefficient of thermal expansion?

R. C. H.

WE manufacture steels of this type containing both 36 per cent and 42 per cent nickel. The smaller has the lower coefficient of expansion within the range of atmospheric temperatures, but the latter has a greater degree of dimensional stability. That is, its low coefficient of expansitivity is retained to higher temperatures than in the case of 36 per cent nickel.

Bethlehem Steel Co.

WE make a steel known as Invar, which is a low-carbon steel alloy containing about 36 per cent nickel. This alloy, we believe, has a lower coefficient of expansion than any of the other steel alloys. Its range for 1 deg. C. is from 0.00000037 to 0.00000044.

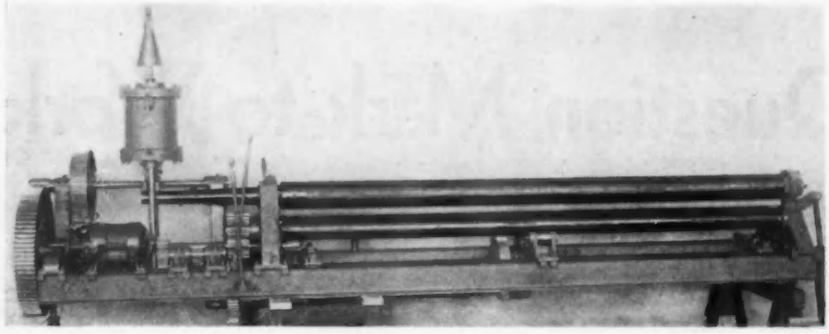
Latrobe Electric Steel Co.

Tools for Cast Steel

I have a lathe job calling for the roughing of cast steel cylinders in quantity. I find that the tool steel cost on this job is excessive. Can you give some suggestion for reducing it?

C. E. W.

IN similar work we have been able to make appreciable savings by using tipped tools. For the shank of the tool we use steel of the following analysis: 0.55 per cent carbon, 0.75 manganese, 0.04 phosphorus and 0.15 silicon; and for the tip we use a cutting steel as follows: 0.70 per cent carbon, 4.0 chromium, 1.0 vanadium and 18.0 tungsten. **J. M. H.**



Pyramid-Type Plate Bending Roll

A HEAVY-DUTY horizontal pyramid-type bending roll having capacity for ¼-in. by 12-ft. mild steel plate, which it handles at the rate of 30 ft. per min., has been completed by Wickes Brothers, Saginaw, Mich. The top roll is 10 in. in diameter, but is interchangeable with rolls 8¾ and 7¾ in. in diameter. The lower rolls are 6 in. in diameter.

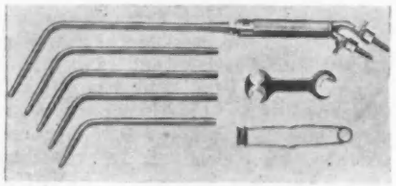
Features include a power knock-down and a power tip-up for the top roll, both operated by air cylinders. The frame of this machine, which is designated as the No. 4-B-12-P, is made of welded steel, and all gears are of steel and have cut teeth. The elevating screws are equipped with ball thrust bearings, which are immersed in oil, as are the bevel gears and pinions that drive the elevating screws. A dial indicator shows the position of the top roll. The bearing for the tail-end journal of the top roll remains on the journal during the knock-down operation in order to prevent entrance of scale or dirt. Bearing lubrication is by means of a "one-shot" system. The machine is driven by a 15-hp. motor (not shown in the illustration); a separate motor is provided for the elevating device.

Welding Torch for Heavy and Light Work

THE Linde Air Products Co., 30 East Forty-second Street, New York, has announced a No. 28 Purox welding torch adapted for heavy-duty as well as average work.

Ten one-piece, 60-deg. gooseneck tips are available for use with this torch. These tips are built to withstand the intense reflected heat of the heaviest welding job and by means of a union nut, they may be adjusted so as to point in any direction. Thus, overhead or vertical welding can be accomplished without any change in the normal grip of the torch handle. The five tips, Nos. 6, 8, 10, 12 and 14, regularly furnished, give the torch a range from No. 16 gage sheet up to heavy castings. By using the Purox No. 21 cutting attachment with this torch, steel up to 2 in. in thickness can be cut.

A Purox No. 28B welding torch is also offered. This carries tips Nos. 6, 8 and 10, mixer No. 6-10, friction lighter and wrench. By means of an adapter, Purox No. 11 welding torch tips can be used on both the No. 28 and 28B torches. This extends the range of the No. 28 welding torch in the lighter welding field, and obviates investment in an additional small torch when there is only occasional need for light welding.



Improved Hansen Arc Welders

NEW magnetic bridge, a unique short circuit winding and a dead front control panel are features of the improved Hansen arc welders announced by the Harnischfeger Corpn., Milwaukee. The purpose of the short circuit winding is to reflect current fluctuations back into the main field in order to quicken arc recovery. The new magnetic bridge further aids arc recovery and arc stability and at the same time increases the welding range. The dead front control cabinet simplifies design by placing the voltmeter, ammeter, etc., on a single compact cabinet which also adds to the general appearance of the unit.

These welders may be had in 100 to 800 amp. sizes and electric motor drive. Variants in stationary and portable types are designed to operate either on alternating or direct current. In the 100, 200 and 300-amp. sizes the motor and generator are mounted as a single unit with two bearings. In the 400, 600 and 800-amp. sizes the motor and generator have four bearings and are direct coupled. They are mounted on a welded steel base.

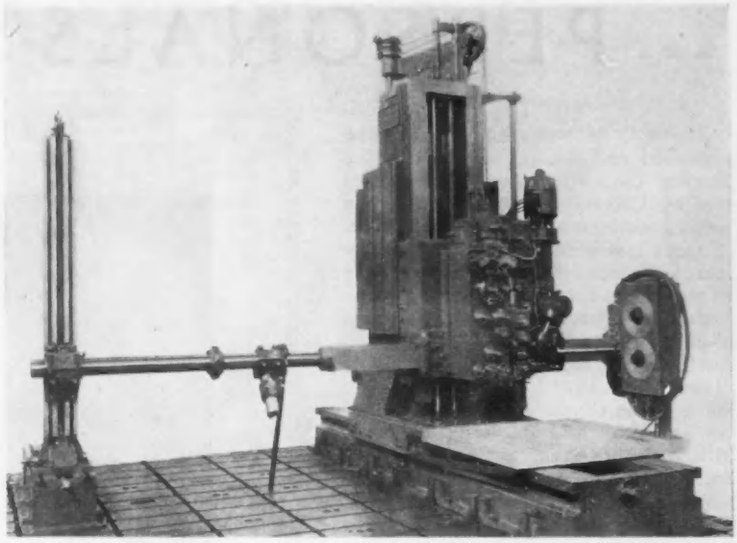
Designs Die That Opens At End of Cut

THE Threadwell Tool Co., Greenfield, Mass., has brought out the hexagon die illustrated, which may be opened instantly at the end of the cut, and removed without backing off.

In addition to providing an adjustable tool for cutting new threads, this die may be used to advantage in restoring jammed threads. It is adjustable for tight and loose fits, and may be opened or closed by a half turn of the lock screw. It can be used with a die stock or common nut wrench. Screw sizes range from ¼ to 1¼ in.

National Association of Waste Material Dealers, Inc., New York, will hold its twentieth annual convention at the Sherman Hotel on March 13 to 15.

Combination Boring, Drilling, Milling and Planing Machine



THE Morton Mfg. Co., Muskegon Heights, Mich., has added to its line a new horizontal combination boring, drilling, milling machine and draw-cut traveling-head planer for horizontal boring, drilling, milling, vertical milling, right-angle boring, shaping, planing and slotting operations. This machine has a cutting stroke of 48 in. and a bed 14 ft. long, giving 9 ft. of horizontal feed and 48 in. of vertical feed on the column. It can be furnished, however, with other lengths of cutting stroke, of horizontal feed or of vertical feed. In performing several operations at one set-up, savings in crane service and resetting time are claimed for the machine. Floor plate, work tables, boring bar and outer support, vertical milling and other attachments and equipment can be furnished.

The bed is a rigid one-piece casting, and the column, also of heavy construction, is cast integral with the bottom saddle. The vertically moving apron, or saddle, forms the bearing surface for the reciprocating ram and also supports the feed and other working mechanism. The ram is approximately 8 in. square. It is ground to a bearing and its rack teeth are cut from the solid. Within the ram there is a 4½-in. diameter heat-treated ball-bearing arbor, which is of special design to compensate for extreme torsional strains.

An improved feed change gear box gives 30 feed changes for boring and milling. The quick-change gear is said to make possible changing from boring and milling to planing or slotting within 1 min. Milling feeds can be changed quickly in either direction by a lever shift. Rapid power traverse in all directions is provided.

The ram is reciprocated by means of a reversing motor drive. The stroke may be adjusted to any position or length by moving the tappets located on the front of the control box. The drive for the boring and milling is from the same motor, the power being transmitted through miter gearing and a vertical shaft to the mechanism contained in the vertically moving apron.

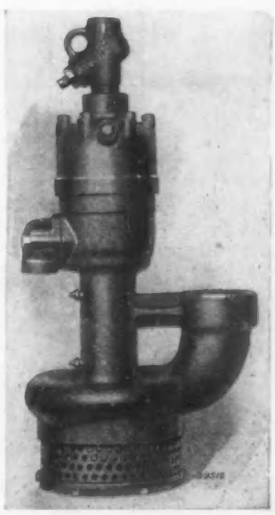
The machine is equipped with a direct-current reversing planer type motor of not less than 10 hp. The speed range is from 250 to 1250 r.p.m. and the arrangement is such that speeds may be varied either on the cutting or the return stroke. The approximate floor space required is 14 x 16 ft. and the weight of the machine with the various attachments is 44,000 lb.

New I-R Air-Operated Portable Sump Pump

A NEW portable, air-operated sump pump has been developed by Ingersoll-Rand Co., 11 Broadway, New York. It consists of an open-impeller type centrifugal pump driven by a multi-vane air motor and both inclosed in a one-piece housing. The unit weighs 50 lb. and is designated as sump pump size 25.

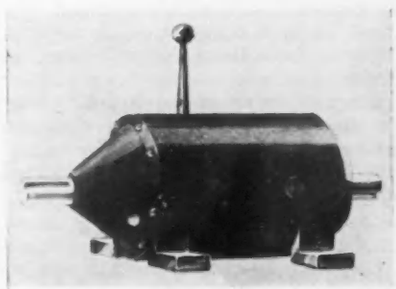
The pump will handle clear or dirty water, oil sewage, or moderately heavy sludge. Materials used are suited to the services and include bronze, stainless steel and rust-proof steel for installations that require them.

The pump is intended for lifts of 10 to 40 ft. with air pressure of 70 to 90 lb. Using air at 80 lb. pressure, the capacity ranges from 170 g.p.m. with 10-ft. lift through 20 ft. of 2½-in. hose to 125 g.p.m. with 40-ft. lift through 50 ft. of 2½-in. hose. The pump is self-priming, as it has no suction lift, and must be submerged to cover the inlet screen.



Variable-Speed Unit Has Wide Range

WITH the mechanical variable-speed transmission unit illustrated any desired speed ratio from 1 to 1 to 3000 to 1 is obtainable through a simple manual control. Neither fluids nor clutches are employed, and the transmission is said to maintain exact ratio at all speeds without slippage. Full range of speeds is obtainable in both forward and reverse directions without altering the speed or direction of rotation of the motor. Stopping, starting, forward and reverse are accomplished by turning the one hand lever. The transmission is housed in an oil-tight case of approximately the same proportions as that of a standard gear speed reducer. The new products department of the G. M. Basford Co., industrial marketing counsellors, 60 East Forty-second Street, New York, is marketing this variable-speed unit, development of which is credited to A. Ban Basoff, one of the department's associate engineers.



... PERSONALS ...

ALDUS C. HIGGINS has been elected president and general manager of the Norton Co., Worcester, Mass., succeeding CHARLES L. ALLEN, who has become chairman of the board. Mr. Higgins has been associated with the company since 1900, in the early years as manager of its research laboratory, manager of research and abrasive plants. He was secretary from 1912 to 1919 and treasurer and general counsel from 1919 to the present time. He is a son of one of the founders of the company and its first president, Milton P. Higgins. Mr. Allen has been identified with the Norton Co. since the incorporation of the old Norton Emery Wheel Co. in 1885. He has been the only general manager the company has had and has been president since 1919. GEORGE N. JEPPSON, vice-president in charge of production, has been elected treasurer to succeed Mr. Higgins.

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HARRY T. GILBERT, who resigned as general manager of the Midland Steel Products Co., Cleveland, in June, 1932, has been appointed manager of sales in the Chicago district of the Illinois Steel Co. He succeeds David T. Buffington, who becomes a special agent in the general sales department. From 1894 to 1904 Mr. Gilbert was associated with the New Orleans representative of Illinois Steel Co. He spent one year with Foust & Gilbert, coke, iron and steel brokers at Birmingham. He then became sales manager of the Sharon Steel Hoop Co., and in April, 1928, he became vice-president in charge of sales of the Republic Iron & Steel Co. He remained with the reorganized Republic Steel Corpn. until September, 1930, when he joined the Midland Steel Products Co.

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COL. CHARLES H. MARCH has been elected chairman of the Federal Trade Commission, Washington.

❖ ❖ ❖

F. J. GIROUX has become affiliated with the Universal Power Corpn., Cleveland, as sales manager of the company's Universal arc welders in the New York district. Mr. Giroux has had wide experience as a consulting engineer in the welding field. After having graduated as mechanical engineer from Oregon State College he became connected with the Westinghouse Electric & Mfg. Co. and later was engaged in collecting welding data for Arcos, Inc., a subsidiary of La Soudure Electrique Autogene, Brussels, Belgium. He subsequently became identified with the Roessler & Hasslacher Chemical Co., and while with that organization reorganized its welding department.

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GREENE FENLEY, JR., who for the last 14 years has been connected with the pig iron and coke business in the Cincinnati district, has been elected president of the new Eaton, Rhodes & Co., Inc.

A. C. HIGGINS

H. T. GILBERT

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CHARLES J. WHIPPLE, president of Hibbard, Spencer, Bartlett & Co., Chicago, wholesale hardware distributers, has been elected a director of the First National Bank of Chicago.

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EARL L. RAMSE, who has been in the general sales office of the Ex-Cell-O Aircraft & Tool Corpn. at Detroit, has been appointed production engineer working with the sales representatives of the company in the different territories. In 1928 he became Buffalo branch manager for the William G. Harvey Co., Syracuse, N. Y., handling Ex-Cell-O products and associated lines, and at the beginning of 1931 joined the Ex-Cell-O sales force.

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JOHN N. WILLYS, chairman, Willys-Overland Co., Toledo, Ohio, has been elected to the board of directors of Warren Foundry & Pipe Corpn., Phillipsburg, N. J., to succeed E. F. NICKERSON, who has resigned.

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H. M. LUCAS, president, Lucas Machine Tool Co., was reelected president of the Associated Industries of Cleveland, at the annual meeting, Jan. 20. Other officers also were reelected. These are: Thomas Ferry, president, Ferry Cap & Set Screw Co., vice-president, and W. L. Seelbach, secretary-treasurer, Forest City Foundries Co., secretary.

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EDWARD BAUSCH, president of the Bausch & Lomb Optical Co., Rochester, N. Y., was the guest of honor at a dinner given in New York, Jan. 23, by the Society of the Genesee.

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E. L. BERRY, formerly shop superintendent, has been given supervisory charge of manufacturing, engineering and erection of the Thirty-ninth Street plant of the Link-Belt Co., at Chicago.

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W. V. BAKER, president, Detroit Sheet Metal Works, Detroit, spoke on current business problems on Jan. 16, during the Detroit Board of Commerce broadcast over station WJR.

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GEORGE S. WHYTE, president, MacWhyte Co., Kenosha, Wis., was reelected president, Wisconsin Manufacturers' Association, at the annual meeting in Milwaukee. GEORGE F. KULL, Madison, Wis., was reelected secretary-manager. S. GWYN SCANLAN, president, Scanlan-Morris Co., Madison, was elected treasurer. Directors include W. D. JAMES, president, James Mfg. Co., Fort Atkinson; F. H. CLAUSEN, president, Van Brunt Mfg. Co., Horicon; GEORGE VITS, president, Aluminum Goods Mfg. Co., Manitowoc; JAMES L. WILSON, vice-president, Nash Motors Co., Kenosha, and GEORGE S. HAMILTON, president, Hamilton Mfg. Co., Two Rivers.

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F. ALEXANDER CHANDLER, who was affiliated with Chandler & Farquhar Co., distributer and dealer in hardware and mill supplies at 360 Devonshire Street, Boston, for over 30 years, and who was for 10 years president of the company, has resigned and intends to become a manufacturers' representative.

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E. D. WOLF has joined the Ex-Cell-O Aircraft & Tool Corpn., Detroit, and will have charge of the general sales office. From 1919 to 1925 he was with the Taft-Peirce Mfg. Co., Woonsocket, R. I., in the production departments and then was transferred to the Detroit office as district sales manager. In June, 1930, he became general sales manager of Whitman & Barnes, Inc., Detroit, remaining in that capacity until he joined the Ex-Cell-O company.

OFF THE ASSEMBLY LINE

January Motor Car Output Shows Gain; Decline Expected in February

DETROIT, JAN. 23.

FEBRUARY admittedly will bring a temporary decline in automobile production, but just now Detroit still is engrossed in the process of filling dealers' requirements, and assemblies have taken an upward turn. There has been an intensification of Chevrolet's activities which will continue at least the remainder of the month. The local gear and axle and forge plants are operating six days a week, and some branch assembly plants are running six days a week 24 hr. a day.

This speeding up of manufacture will carry Chevrolet's January production to the 55,000 mark, against the 47,000 estimated a week ago. It is understood that Chevrolet's deliveries to retail customers in the first 10 days of January exceeded 10,000 units and that the figure for the second 10 days was considerably higher. Moreover, a further gain in the final 10-day period of the month is virtually assured. This excellent retail demand is fulfilling the best hopes of Chevrolet officials.

Oldsmobile has not yet reached its early production peak, so that activities at its Lansing plant will be sustained near present levels for the next 30 days or longer. Its schedule is still about 6000 cars this month. Pontiac continues its relatively high rate, with close to 10,000 units coming off the assembly line this month. Cadillac is proceeding at a leisurely but consistent pace of 800 to 1000 cars a month. Buick, first General Motors division to bring out its new line, is slowing down with 3500 to 4000 cars as the January goal. Willys-Overland is turning out its four-cylinder job at the rate of 300 units a day and is just starting production on its six-cylinder car. Its working force now totals 8500 men. The various Chrysler divisions have not changed their program of operating four days a week. Studebaker and Nash are reported to have small schedules. Reo and Hupp are doing little in passenger cars aside from providing dealers with minimum stocks. Hudson is going ahead cautiously with assemblies limited to actual dealers' needs.

Ford Becoming More Active

Ford's plans once again are the center of attention in Detroit. It is known that two lines will be offered powered by V-eight motors. One will have a wheelbase of approximately 112 in., while the other will be mounted on a chassis about the size of the present V-eight. It is understood that 250 units a day of the larger car are now being produced at the Rouge plant, but operations on the smaller car are just getting started. Briggs and Murray are said to be shipping to assembly plants about 700 bodies a day, three days a week, for the larger car, which will be identified as model 40. Parts contracts for the small car, to be known as model 44, are now being let. The bumper requirements will be supplied by the General Spring & Bumper Co. Initial steel releases, especially for front axle stock, are expected in the next few days. It will be at least 30 days before Ford production begins on a large scale. However, the Ford program gives promise of contributing substantially to the industry's total and in turn to steel tonnage during the spring months.

Ford probably will announce its larger eight next Saturday. Production, which is now on a basis of five days a week, will be increased as rapidly as possible to 1200 to 1500 units daily from the present rate of 250 units. It now looks as though Ford production in February will be at least 20,000 cars. Ford is expected to place steel orders this week covering requirements up to March 1. It is understood that the smaller car aimed at the model T market will not be ready to show much before April 1. It will be powered by a V-eight motor somewhat smaller than the one in present model 18 and its wheelbase will be about 116 in. Ford is said to be planning on manufacturing 3000 units daily of the small car.

In an endeavor to cut production costs many automobile companies have been exerting extreme pressure on steel mills and other makers of materials for lower prices. Some suppliers, however, have stood their ground, refusing to make ruinous concessions. For example, a large motor car maker offered to give a three-months' contract for its entire requirements of certain parts to a supplier, provided that a certain low price was accepted. The supplier declined to do business on that basis. The automobile company approached three other companies with the same proposal and in every case met with a rebuff.

Chrysler is considering the manufacture of many more parts of its cars for the Canadian and overseas markets at its Canadian plant. General Motors is reported to be contemplating similar action to conform to the program agreed upon by Canada at the Ottawa Conference. If either company decides to make its Canadian plants relatively self-integrated units, it will have to purchase a number of American-built machine tools in the process of tooling up for additional work. However, it is likely that little will be done until the Roosevelt administration takes office and some light is thrown on the possibility of a reciprocal tariff arrangement between the United States and Canada, which may lower present duties on parts produced in Detroit for assembly in Canadian cars.

Detroit Notes

Hupmobile has attained weight reductions, particularly in the transmission, by using high-strength steel alloys which permit a more compact design. . . . In the bodies of the six and shorter eight lines of Graham-Paige a novel steel construction is employed. The rear seat pan and side panels are welded together and the unit thus obtained is welded to the rear section of the body. . . . For increased insurance against gasket leaks, steel has been substituted for copper in the cylinder head and manifold gaskets of 1933 Packards. . . .

OBITUARY

ALFRED J. PORTER, SR., superintendent of the Bridgeport, Conn., plant of the Heppenstall Co., died suddenly on Jan. 17. His first contact with the metal-working industry was with the former Bement & Niles Co., Philadelphia. Later he was appointed manager of the machine division of Tindle, Morris & Co. In 1906, Mr. Porter became associated in a managerial capacity with the Bridgeport Forge Co., and, when this company was acquired by the Heppenstall Co., he was appointed superintendent.

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W. A. GARRIGUES, who retired as president of Levering & Garrigues Co., New York, when that company was acquired by the McClintic-Marshall Corpn., died on Jan. 19 at Thomsville, Ga., while on a motor trip in the South. For many years he was president of the Iron League of New York. Mr. Garrigues was 66 years old.

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CLARENCE E. WHITNEY, president of the Whitney Mfg. Co., Hartford, Conn., died of a heart attack at his home at that city on Jan. 22. He was born in Hartford on Nov. 26, 1869, son of Amos Whitney, one of the founders of the Pratt & Whitney Co. He was graduated from Massachusetts Institute of Technology in 1891 and later went to Germany to study the industrial methods of that country. On his return to Hartford he served the Pratt & Whitney Co. for about a year. Mr. Whitney was secretary-treasurer of the Hanson-Whitney Co. and of the Hanson Tap & Gage Co., and a director of the Skayef Ball Bearing Co.

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CLARENCE L. ALTEMUS, who had spent most of his adult life in the steel trade, as metallurgist and in sales work, died on Jan. 23 at his home, 102 Gates Avenue, Montclair, N. J., of heart disease at the age of 54. Mr. Altemus was for many years with the Cambria Steel Co. and later with the American Steel Export Co. Several years ago he engaged in business for himself in New York under the name of the Terminal Steel Supply Co., which distributed wire products and specialties. He closed out this business two or three years ago and had since been living in retirement.

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BASIL MAGOR, consulting engineer and formerly president of the Magor Car Corpn., New York, died of a cerebral hemorrhage at his home in New York on Jan. 14, aged 62 years. He was born in Montreal and was graduated as a civil engineer from the Rensselaer Polytechnic Institute in 1894. In 1902 he went to China in connection with the building of the Canton to Hankow railroad. Mr. Magor was the founder of the Magor Car Corpn. in 1902 and also was founder and former president of the National Steel Car Co. During the war, he was a district manager at Port Jefferson, L. I., N. Y., for the Emergency Fleet Corpn.

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AUGUSTINE DAVIS, inventor and journalist, and known to the metal-working industry for his development of acetylene equipment, died of penumonia at his home at Jamaica, Long Island, on Jan. 19, age 81 years.

In 1896 he invented an acetylene lighting generator and established the Davis Acetylene Co., setting up a plant at Elkhardt, Ind., to build his generators, for which he received a gold medal at the St. Louis Exposition in 1904. He also was elected president of the International Acetylene Association. In association with Eugene Bournonville, Mr. Davis brought to this country oxy-acetylene torches invented by Edmond Fouche of France. Later he arranged for licenses to manufacture, under French patents, oxy-acetylene welding and cutting apparatus. In 1907 the Davis-Bournonville Co. was established. Between 1908 and 1917 he headed the Davis Acetylene Developing Co., the Davis Oxygen Co. and the Davis Town Lighting Co., which, with the Davis-Bournonville Co., maintained their plants at Jersey City.

During the World War the Davis-Bournonville Co. sent 100 of its employees to France for special service in developing the use of welding equipment for the Army and in the Jersey City plant established welding schools for soldiers and sailors.

In 1920, Mr. Davis organized the Davis Automatic Equipment Co. for the manufacture of coin-controlled checking apparatus. He was a director of several corporations.

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NEIL MCMILLAN, until last month secretary of the Detroit Metal Specialty Co., Detroit, died of heart disease on Jan. 20, aged 80 years. He had been previously connected with the Detroit Sheet Metal Works, the Art Stove Co., of which he was president, and the National Can Co., which he organized in 1901. Born in Edinburgh, Scotland, Mr. McMillan came to America early in life. After spending several years in California, he located in Detroit in 1882.

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CHARLES N. BIGGER, for 25 years Cincinnati representative for various tool manufacturers, died in Cincinnati at the age of 61 years.

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ROY L. MONGE, assistant sales manager, Rockford Machine Tool Co., Rockford, Ill., died Jan. 7 after a short illness. He was born at Rockford and eight years ago became associated with the machine tool company as an apprentice. His advancement was rapid to the position of assistant sales manager.

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REIMAR F. C. KURTZE, engineer, died Jan. 17, at Youngstown. He was born in Germany and was a classmate there of the late Rudolf Diesel, inventor of the Diesel engine. Mr. Kurtze came to America in 1900, engaging in engineering work at Fort William, Ont. In 1914 he joined the engineering staff of the A. O. Smith Corpn., Milwaukee, and had a part in the design of automatic production machinery for pressed steel automobile frames.

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HERMAN HENNING, one of the founders of the Cream City Boiler Co., Milwaukee, and vice-president until his retirement two years ago, died at his home in Hayward, Wis., on Jan. 18, aged 70 years. He was born in Milwaukee and was engaged in the boiler industry 50 years.

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ARTHUR L. GARFORD, president and organizer of the Cleveland Automatic Machine Co., Cleveland, died suddenly at his home in Elyria, Ohio, Jan. 23, aged 74 years. He was prominent in the industrial field in Elyria, where he was president of the Electric Alloys Co., and a director of the Perry-Fay Co. In his early years he gained prominence as a manufacturer of bicycle saddles and parts and later was the head of the Garford Co., manufacturer of automobile parts.

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DANIEL DUFFIN, SR., founder of Duffin Iron Co., Chicago, fabricator of structural steel, died Jan. 17, aged 88 years. He was a native of Ireland and went to Chicago as a young man and formed the Daniel Duffin Iron Co. in 1876. The original company, organized for the purpose of fabricating ornamental iron, continued at several locations until 1914 when Mr. Duffin retired and the present Duffin Iron Co. was incorporated.

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Chromium Plating Patent Upheld

WASHINGTON, Jan. 24—The United States Supreme Court yesterday denied a petition of the International Silver Co. for a review of lower court decisions in a suit against the United Chromium Co. The lower courts held that a patent of the latter for chromium plating is valid. The patent is said to be based on a formula prescribed in a paper by George J. Sargent of Cornell University.

• • EDITORIAL COMMENT • •

Engineers Disavow Technocracy

A STATEMENT sharply critical of Technocracy by Perry A. Fellows, manager of the Detroit city airport, was unanimously endorsed by the councillors of the Associated Technical Societies of Detroit at a meeting on Jan. 9.

"The man who, through his faculty for ready use of technical expressions, gains some degree of public confidence, and who then betrays that confidence by announcing that widespread, machine-made, economic disaster is at our very threshold, has no right to label his fear-charged philosophy Technocracy," said Mr. Fellows. "It is ochlocracy, the rule of the mob, that he is promoting.

"Americans have fostered technology and have given it every opportunity to attain its present stature. They have thus earned a right to demand for today's guidance wise counsel instead of threats, words of encouragement and cheer instead of the mutterings of fear. The attitude of the truly scientific man and of the trained technologist is optimistic and constructive. They are not normally imbued with the idea of setting up dicta such as might be imputed to those who adopt the name of Technocracy. They would be much more likely to enlist under a banner bearing the name Techtonics, and, as that name indicates, strive to build rather than to bully."

Even more indicative of the disavowal of Technocracy by our engineering profession was the action taken on Jan. 14 by the American Engineering Council, which is the representative of national, regional and local engineering societies in the United States.

An official statement was issued in extenso by the Council, excoriating the alarming predictions of Technocracy, its unprofessional exaggerations and concealment of evidence, and denying that these represent responsible engineering thought.

"Contrary to these claims," states the concluding paragraphs of the Council's resolutions, "there is nothing inherent in technical improvement which entails economic and social maladjustments. Indeed, technology offers the only possible basis for continuing material progress. The volume of goods produced, distributed and consumed during the years 1928 and 1929 was not excessive. That volume may and should be surpassed upon the return of prosperity.

"The alleged unmanageability of a machine economy has not been proven. Its dislocations are traceable to improper and unskilled use rather than to inherently harmful characteristics. Complete replacement of men by the machine is precluded by the law of diminishing returns. Instances are increasingly in evidence. Contrary to the pronouncements of Technocracy, applied science holds the promise of better things to come in a society which fearlessly and intelligently meets its problems. It is the considered opinion of American Engineering Council that our present economic structure contains within itself the possibilities of progressive improvement and attainment of higher standards of living."

And now, to cap the climax of disavowals, comes the abjuration of Scott and even of the very name "Technocracy" by Dr. Rautenstrauch and his associates at Columbia. Thus endeth the ephemeral eighth wonder of the world!

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New Measures for New Situations

"DO you consider past statistics of any considerable value in determining market potentialities?" To this inquiry, one of the number included in THE IRON AGE's recent survey of metal-working plants, 212 companies answered "No," while 158 answered "Yes," as reported on page 24 of the issue of Jan. 5. What is of more significance, however, as indicating the spirit of the industry and the extent of its expectations for 1933 is that 139 companies of those answering on this point are making new market surveys. On the other hand, 237, or nearly a hundred more, are not yet systematically trying to appraise the future demand for their product in view of what has happened to business since the middle of 1929.

There should be no great surprise that 212 out of 370 companies replying to the first question should depend but little on statistics in laying plans for the nearby or the farther future. They well recall what the statisticians and the chart-makers and chart-readers predicted, in the light of what happened in other depressions—the beginning of recovery in 1931 and a continuance of the upswing in 1932, neither of which things came to pass.

Nor was there much illumination on the future in some of the statistical comparisons between 1932 and other years as given in the Jan. 5 issue of THE IRON AGE. It would be hard, for example, to project a curve for 1933 from a Lake Superior iron ore movement of 3,567,000 tons in 1932, or a little more than one-twentieth of the 65,204,000 tons shipped in 1929, only three years earlier.

One might expect, in view of the poor repute of statistical prophets just now, that more manufacturers in the metal trades would be setting out on their own account to get a new measure of the possible market for their products. However, if the majority of those reporting to us were right in believing that the "corner" was turned in September, there is at least an even chance of more stable conditions in the new year, and thus more warrant for initiative than 1932 could give.

It is a promising sign that, even among those who are undertaking no special survey of their present-day market, a considerable number intend to add to their lines this year. Whereas 254 companies out of 384 answering the question "Did you bring out new products in 1932?" replied in the affirmative, 193 intend to market new products in 1933.

On the whole the returns from our inquiry speak well for the metal-working industry. A good many concerns are drifting, but the larger number are meeting change with change. That so many have set out to shape events instead of being shaped by events indicates an amount of courage, resourcefulness and intelligent planning that should count definitely on the right side of the balance sheet for 1933.

German Machinery Builders Bidding on Hoover Dam Work

Unless Legislation Is Adopted Government May Be Obliged to Place Contract Abroad

WASHINGTON, Jan. 24.—Unless the Department of Interior is given early protective legislation, it may be compelled to award contracts aggregating about $17,000,000 to foreign makers for machinery for the power plant at Hoover dam. Under the department's appropriation act contracts must be given to the lowest bidder. Reports indicate that German manufacturers, through their importing agencies in the United States, are prepared to submit bids for machinery for the power plant which would be lower than domestic makers could possibly make. The tariff could be hurdled easily by foreign makers.

It was because a German importing interest was said to be prepared to submit the lowest bid on five 115,000-hp. and two 55,000-hp. turbines with governors and butterfly valves for the Hoover dam power plant that the Wilson "Buy American" bill was rushed through the House on Monday of last week. The contracts will involve about $3,000,000 and the bids are to be opened Feb. 3.

The bids, of course, may be rejected if the bureau should consider that all requirements, such as specifications, etc., are not met. In such an event a reopening date would be set. Other bids to be asked for machinery for the power plant are to be called for later and will involve about $14,000,000.

Some Objections to Wilson Bill

Meanwhile, efforts are being made to overcome objectionable features of the Wilson bill which numerous manufacturing interests, including iron and steel, metal-working and the National Association of Manufacturers say is too tightly drawn. This bill, introduced in the Senate by Senator Steiwer of Oregon, is before the Senate Committee on Expenditures in the Executive Departments. A somewhat similar measure is before the Senate Committee on Commerce. The Wilson bill, it is claimed, is so hard and fast in its provisions that no foreign material, no matter how small a portion it may be of the completed article, may be used in Government work. As virtually all products contain a certain percentage of foreign raw material, often extremely small but essential, the measure is held to be impracticable.

Difficulty is being found in ironing out the imperfections of the Wilson bill and amendments to this end have been introduced in the Senate. At present there is a tendency to favor an amendment offered by Senator Johnson of California, which is similar to a provision carried in existing acts for a number of Government departments, aside from the Department of the Interior. This provision requires executive departments and independent establishments to purchase only articles "of the growth, production or manufacture of the United States, unless the interests of the Government will not permit, notwithstanding that such articles . . . may cost more, if such excess of cost be not unreasonable." This provision in itself is held to be faulty if too literally construed, yet it has been found to work rather satisfactorily and therefore is generally favored until it has been further perfected. It is believed that despite the jam in the Senate some such legislation may be quickly enacted. It would immediately cover all Government purchases.

Steel Founders to Seek Closer Cooperation With Customers

STEPS to bring about closer cooperation between buyers and sellers of steel castings were taken at the annual meeting of the Steel Founders' Society of America, Inc., at the Statler Hotel, Detroit, on Jan. 19. The need for putting greater emphasis on merchandising and selling, particularly in finding increased uses for steel castings, likewise was stressed. Speakers were of one mind in pointing out the demoralizing effect on the industry resulting from the practice of booking orders at less than actual production costs.

An address by Clarence Tolan, Jr., Dodge Steel Co., Philadelphia, in which he attacked the selfish purchasing policy of buying materials solely on a competitive price basis was a high spot of the meeting. Mr. Tolan referred to companies which adhere to such a policy as "leaders in the gospel of fear and destruction" and vigorously advocated the adoption by all manufacturers of a one-price buying program.

Declaring that steel foundries have made common cause in solving technical and production problems, but do not stand together in the determination to take business only at a price which yields a profit, Frederick A. Melmoth, vice-president, Detroit Steel Casting Co., Detroit, said that the only way to better the situation is for steel founders to base their prices on true production costs. He admitted that the adoption of such a policy would tend to give work to foundries most adequately suited for a particular job, but emphasized that this is as it should be.

Granville P. Rogers, managing director of the society, stated that destructive selling must be supplanted by constructive selling and the finding of new uses for many forms of cast steel. He remarked that "with due respect to the value and necessity of expense control and reduction, which for the past year at least has dominated operations of most steel foundries, the question may now be asked whether the time has not come to put the controller in the back seat and those responsible for merchandising and selling of steel castings in the driver's seat." He said that proper merchandising consists of constructive selling that will point to the serviceability of cast steel in its various forms, the type of service the individual foundry can render, its reputation in the field, and above all the seeking out of new fields where cast steel can be applied. He suggested to steel founders the possibility of developing business in connection with welded products and urged investigation of the advantages of establishing welderies as an adjunct to their present plants.

"The executive who is willing to resight his selling guns on this year's markets should give close attention to the development of a sales sense in every employee, not overlooking those handling correspondence," added Mr. Rogers. "It is as important for the executive to watch the type of letter representing his firm as to study the type of salesman who sells his products; he is judged by both."

The times call for the exercise of faith and fortitude, declared Arthur Simonson, Falk Corpn., Milwaukee, in his presidential address. He predicted that industry will emerge from its present state "in spite of Technocrats, or other 'crats,' cults, 'isms' or 'ologies' which clutter up the immediate foreground."

Production of steel castings in 1932 averaged 10 per cent of capacity, according to the annual report of Mr. Rogers. The tonnage amounted to only half of that in 1921, the previous low point for the industry. Even in 1929, when the industry reached its greatest sales volume, idle capacity totaled 772,000 net tons. In 1930 this increased to 1,251,000 tons, and in 1931

(Concluded on Page 180)

SUMMARY OF THE WEEK'S BUSINESS

Steel Production Rises to 17 Per Cent; More Diversified Demand a Factor

Automobile Industry, However, Is Still Chief Sustaining Influence—Ford to Step Up Output of New Models

STEEL-MAKING operations continue to expand slowly, this week's production of ingots being estimated at 17 per cent of the country's capacity. A gain of about one percentage point has occurred each week since the beginning of the new year.

The most striking changes have occurred at Chicago and Cleveland. In the Chicago district, where output had remained at about 9 per cent of capacity since the week before Christmas, the rate has risen sharply to 14 per cent because of a more diversified demand, as well as considerable support from the automobile industry, while at Cleveland steel-making has increased from 41 to 44 per cent on an influx of orders for bars from the motor car makers. The Pittsburgh district has also gained moderately, but operations in the Valleys are lower than last week, owing to the idleness of one of the plants in that district. Elsewhere operations are holding their own or have improved a little.

THE motor car industry is still the major sustaining factor in steel mill schedules, but steel companies are deriving a modicum of encouragement from evidences of more liberal orders, mainly in small lots, from other sources.

Although a few makers of automobiles are expected to curtail production in February while awaiting the development of retail demand now that dealers have been stocked, others have made known that they will extend the present schedules through next month, and any losses that may occur in some plants probably will be fully made up by increased output of the Ford Motor Co., which will swing into production of 1200 to 1500 cars daily as quickly as possible. Ford is now producing 250 cars a day five days a week.

Ford's schedule for February is at least 20,000 units of its new models. Its large eight-cylinder car may be shown to the public next Saturday. Its small model, aimed at the market, once filled by the old model T, may not be ready to show before April 1. The company is said to be planning on building 3000 a day of this car, which will be in the lowest-price class. Steel orders from Ford covering requirements up to March 1 are expected this week.

WHILE the steel industry is inclined to believe that the past week's developments have improved the outlook for February, there is considerable disappointment that sources of steel buying that ordinarily would be active at this season are almost dormant. The railroads, in particular, are giving few signs of coming into the market for any of their usual spring requirements. Except for improvement in releases for track supplies for some urgent track work in the Chicago territory, not much railroad buying is being done. A few releases for small amounts of rails against last year's contracts have been received by the mills, but 1933 orders are still in abeyance and probably will not be placed before March. The question of the extension of freight surcharges beyond March 31, the expiration date, and the attitude of the new national administration toward the railroads are factors that without doubt are delaying action by the carriers on needs that may ultimately become urgent.

The farm machinery industry is experiencing a better demand, and output probably would be expanded if it were not for the credit situation in agricultural areas. This industry is looking to Washington to aid the farmers before making any important move toward larger production.

Two oil companies have placed orders for pipe lines, one of 6000 tons and the other 1300 tons, and, while this business will benefit pipe mills for only a short period, there is encouragement in the fact that a long deadlock in pipe line laying is to be broken.

Building construction is not making much progress, but some inquiries for private work lend interest to a market that has long been dominated by public projects. Interest is centered in the San Francisco-Oakland bridge, which may require 175,000 to 200,000 tons of steel.

PRICE weakness is still a depressing factor in the steel market. Sheet prices are badly jumbled, although efforts are being made to bring about stabilization at the lower levels that have been reached in the past two weeks. Meanwhile, prices have been revised downward $2 a ton on vitreous enameling stock, terne plate, tin mill black plate and cold-rolled fender stock, while heavy cold-rolled sheets are $1 a ton lower. The weakest item is galvanized sheets of which there have been some sales at 2.60c. a lb., Pittsburgh. Wire products seem to be steady at the reductions of $2 to $6 a ton reported a week ago. In the East, plates are quoted at a range of 1.50c. to 1.70c., Coatesville, Pa.

CONTINENTAL European steel markets are strengthening on Far Eastern demand, principally from Japan, which is buying all forms of steel, including semi-finished. Japan is also an active buyer of new and used machine tools in the United States.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Jan. 24, 1933	Jan. 17, 1933	Dec. 27, 1932	Jan. 26, 1932
Per Gross Ton:				
No. 2 fdy., Philadelphia	$13.34	$13.34	$13.34	$15.64
No. 2, Valley furnace	14.50	14.50	14.50	15.50
No. 2 Southern, Cin'ti	13.82	13.82	13.82	13.82
No. 2, Birmingham	11.00	11.00	11.00	11.00
No. 2 foundry, Chicago*	15.50	15.50	15.50	16.50
Basic, del'd eastern Pa	13.50	13.50	13.50	16.25
Basic, Valley furnace	13.50	13.50	13.50	15.00
Malleable, Valley	16.89	16.89	16.89	17.89
Malleable, Chicago*	15.50	15.50	15.50	16.50
Malleable, Valley	14.50	14.50	14.50	16.00
L. S. charcoal, Chicago	23.17	23.17	23.17	23.17
Ferromanganese, seab'd carlots	†68.00	†68.00	†68.00	75.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$40.00	$40.00	$40.00	$43.00
Light rails at mill	30.00	30.00	30.00	34.00
Rerolling billets, Pittsburgh	26.00	26.00	26.00	27.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	27.00
Slabs, Pittsburgh	26.00	26.00	26.00	27.00
Forging billets, Pittsburgh	31.00	31.00	31.00	34.00
Wire rods, Pittsburgh	35.00	35.00	37.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.50

Finished Steel

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.50
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.55
Bars, New York	1.95	1.95	1.95	1.85
Tank plates, Pittsburgh	1.60	1.60	1.60	1.50
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.698	1.798	1.898	1.798
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.50
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.86775	1.86775	1.86775	1.76775
Cold-finished bars, Pittsburgh	1.70	1.70	1.70	2.00
Hot-rolled strips, Pittsburgh	1.45	1.45	1.45	1.40
Cold-rolled strips, Pittsburgh	1.90	1.90	2.00	1.90

Finished Steel

	Jan. 24, 1933	Jan. 17, 1933	Dec. 27, 1932	Jan. 26, 1932
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.00	2.00	2.10	2.15
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.10	2.10	2.20	2.30
Sheets, galv., No. 24, P'gh	2.65	2.65	2.85	2.80
Sheets, galv., No. 24, Chicago dist. mill	2.65	2.75	2.95	2.90
Hot-rolled sheets, No. 10, P'gh	1.45	1.45	1.55	1.60
Hot-rolled sheets, No. 10, Chicago dist. mill	1.55	1.55	1.65	1.75
Wire nails, Pittsburgh	1.80	1.80	1.95	1.95
Wire nails, Chicago dist. mill	1.85	1.85	2.00	2.00
Plain wire, Pittsburgh	2.10	2.10	2.20	2.20
Plain wire, Chicago dist. mill	2.15	2.15	2.25	2.25
Barbed wire, galv., P'gh	2.60	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh	$4.25	$4.25	$4.25	$4.75

Old Material

Per Gross Ton:				
Heavy melting steel, P'gh	$8.25	$8.25	$8.75	$10.25
Heavy melting steel, Phila	6.75	6.75	6.75	7.50
Heavy melting steel, Ch'go	5.25	5.25	5.25	7.25
Carwheels, Chicago	7.75	7.75	7.00	7.50
Carwheels, Philadelphia	8.00	8.00	8.00	10.50
No. 1 cast, Pittsburgh	9.00	9.00	9.50	10.00
No. 1 cast, Philadelphia	8.00	8.00	8.00	10.00
No. 1 cast, Ch'go (net ton)	6.25	6.25	6.25	7.50
No. 1 RR. wrot., Phila	7.50	7.50	7.50	8.50
No. 1 RR. wrot., Ch'go (net)	4.50	4.50	4.00	6.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$1.75	$1.75	$1.75	$2.25
Foundry coke, prompt	2.50	2.50	2.50	3.50

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	5.00	5.00	5.00	7.62½
Electrolytic copper, refinery	4.75	4.75	4.75	7.12½
Tin (Straits), New York	23.00	22.70	22.80	22.35
Zinc, East St. Louis	3.00	3.00	3.12½	2.95
Zinc, New York	3.37	3.37	3.49½	3.32
Lead, St. Louis	2.87½	2.87½	2.87½	3.55
Lead, New York	3.00	3.00	3.00	3.75
Antimony (Asiatic), N. Y.	5.80	6.00	5.40	6.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

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▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
Jan. 24, 1933	1.923c. a Lb.	$13.56 a Gross Ton	$6.75 a Gross Ton
One week ago	1.923c.	13.56	6.75
One month ago	1.948c.	13.56	6.92
One year ago	1.933c.	14.64	8.33
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot rolled strip. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1932	1.977c., Oct. 4	1.926c., Feb. 2	$14.81, Jan. 5	$13.56, Dec. 6	$8.50, Jan. 12	$6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Steel Output Gains Slightly; Valleys Lower

Two Fair-Sized Pipe Line Orders Placed—General Consuming Lines Continue Dormant—Prices Still Weak

PITTSBURGH, Jan. 24.—General demand for finished steel products showed no marked change in the last week, although individual companies reported increases. Automotive tonnage is not benefiting the Pittsburgh district materially, and the other major consuming lines continue dormant.

Two fair-sized line pipe orders have come to Pittsburgh and Valley mills in the last week, but will bring only temporary benefit to production schedules in this line. Fabricated structural steel and reinforcing bar tonnage is exceptionally light, and the only important new business promised in this field is on the Pacific Coast. Buying of river craft by both private and Federal agencies is the favorable feature of the market.

Steel ingot production in the district is slightly higher at 15 per cent of capacity, an independent plant which was down last week having resumed production. In the Valleys, steel output has dropped to about 14 per cent, one of the larger plants in the district being idle. Wheeling district production is maintained.

Finishing mill schedules are not changed materially, although tin plate production has eased off slightly, while sheet rolling is up to about 18 per cent.

Price weakness is still a depressing factor and is serving to postpone buying in some lines. Efforts are being made to stabilize sheet quotations, but the market on some grades is still declining. Wire products seem to be holding at the reduced levels announced last week.

Pig Iron

Movement of merchant iron to Pittsburgh district foundries has increased slightly since the first of the month, but many foundries are still inactive and tonnage is very light. No forward buying is reported, and inquiry is confined to carload lots. Prices are unchanged.

Bars, Plates and Shapes

Aggregate demand for heavy hot-rolled products has failed to show consistent gains, and tonnage this month is little heavier than it was in December. Shipments of merchant and alloy steel bars to the automobile trade are holding up, but reinforcing bars are very quiet in this territory, and structural steel projects are less numerous. Federal river improvement jobs are taking some tonnage, and the barge market continues fairly active. A Kentucky coal company will take bids this week on 10 barges, requiring 1500 tons of plate. Nearly 500 tons will be required for two locks on the Allegheny River, which have been placed with a local fabricator. Pittsburgh fabricators are interested in the San Francisco-Oakland bridge, which has been definitely assured. The various contracts on this job, on which bids will be taken up to March 8, will require from 175,000 to 200,000 tons of steel.

Heavy hot-rolled steel prices are unchanged in this district, with sharp concessions not as frequent as they were a short time ago. While very low prices on reinforcing bars have been made in the East, foreign competition has been blamed in most cases and local distributers are still bidding on a 1.50c., Pittsburgh, base. On structural steel, protection to fabricators at very low levels has been withdrawn in a number of cases, and deviations of more than $2 a ton from the mill price of 1.60c., Pittsburgh, are very uncommon. On small lots the 1.60c. price is holding.

Semi-Finished Steel

Weakness in the sheet market has not been reflected in the price of sheet bars, which is still holding at $26, Pittsburgh or Youngstown. Billets and slabs remain at the same figure, and forging billets are quoted at $31. Leading makers of wire rods have generally met the reduction of $2 a ton announced last week, and the market is quotable at $35, Pittsburgh or Cleveland.

Rails and Track Accessories

The market continues very quiet, with little new buying reported, and specifications running at a very low rate for this season of the year. Rail releases have not been sufficient to put the local mill into production, and Eastern carriers show no indication of their probable requirements for the year.

Bolts, Nuts and Rivets

Demand has improved slightly over that of December, but the requirements of the railroads and the structural steel fabricating industry are still very light. A fair movement to the automobile industry is reported. Prices are unchanged at 75 per cent off list for bolts and nuts, $2.25 a 100 lb. for large rivets, and 70, 10 and 5 off list for small rivets.

Tubular Goods

The general run of orders shows little improvement, but two makers have benefited by line pipe tonnages recently. Spang, Chalfont & Co. have taken 1300 tons of 8⅝ in. pipe for a 20-mile line for the Tidewater Oil Corpn., running from the Conroe fields to the Houston ship canal. This is for immediate delivery. Phillips Petroleum Co. is reported to have placed 85 miles of 8⅝ in. electric welded pipe, amounting to about 6000 tons. Otherwise the market is very quiet, although demand for oil country goods is well sustained at recent levels. Mechanical tubing is also somewhat more active than other lines of pipe.

Wire Products

Leading producers are generally meeting reductions of $2 to $6 a ton on wire products, which were unofficially announced last week. Although new schedules have not been issued, the market seems likely to become established at the new levels which place nails at $1.80 a keg, and manufacturers' wire at 2.10c. a lb. Extras on mixed, joint, pool and less carloads are expected to be applied as before. The reduction has brought in little new business, and possibly deferred forward purchases on the part of many buyers.

Sheets

Aggregate demand has not changed materially, but the unsettled price situation has brought about the shifting of some buyers from one source of supply to another. As a result, reports of various companies differ sharply, with some reporting considerably increased tonnage. The automotive industry is the only major consuming line which continues to make a fairly good showing. Although some makers are slowing up their production schedules, others have not reduced their steel requirements, and the motor industry as a whole has not reduced its takings materially. The agricultural implement group is taking more sheets than it was last month, but the requirements of the building industry continue very light, and demand from electric refrigerator makers has not shown much seasonal improvement.

Sheet prices are still badly jumbled, but a tendency to stabilize the market has been noticed recently. Hot-rolled annealed sheets have not been affected as much as other grades, and are still quotable at 2c. to 2.10c., Pittsburgh. Galvanized sheets show the most pronounced weakness, and conditions are particularly bad in centers down the Ohio and Mississippi rivers, which can be reached by a 9c. per 100 lb. water rate. Long ternes are quotably lower, and tin mill black plate for some purposes is very weak.

Tin Plate

No further increases in production have been reported in the last week, and current schedules seem to be slightly lower at 45 per cent of capacity. Last week's production was closer to 50 per cent. Specifications are holding up fairly well, but 1933

contracting has not been entirely completed. The official base price is very well maintained.

Strip Steel

Weakness in sheet prices has not yet been reflected in the market on hot-rolled strip, which continues at 1.45c., Pittsburgh. Automotive buyers are exerting some pressure, but the price is still fairly well sustained. On cold-rolled strip, deviations from the recent minimum of 1.90c., Pittsburgh, have occurred. Demand is holding at recent levels, but has not improved in the last week or two.

Coal and Coke

This market is dull in practically all departments, although shipments of foundry coke have expanded slightly this month. The furnace grade is very quiet. Prices are weak but quotably unchanged.

Scrap

Mill purchases have been lacking in the last week, but the market is holding its own with no noticeable weakness in the principal grades. Not enough scrap is coming out in this district to develop an accumulation of surplus material, and shipments from outside territories ordinarily coming to the Pittsburgh district are very light. Nevertheless, the failure of open-hearth schedules to advance significantly has prevented the scrap market from moving upward as might be expected at this season of the year. Dealers are unable to buy heavy melting steel at less than $8 to cover old orders, and higher prices are being paid in some instances. Specialties are strong in the absence of offerings. The other grades are unchanged from last week.

New Steel Projects Are Lacking on Pacific Coast

SAN FRANCISCO, Jan. 23.—The week has been marked by an absence of new steel projects. The tonnages involved in contracts Nos. 3 and 7 on the San Francisco-Oakland bridge have been announced, although no date has been set for bids. Contract No. 3, involving the anchorage, the structure to Rincon Hill and three piers, will require 1840 tons of reinforcing bars, 1280 tons of structural steel and 225 tons of timber fastenings. The East Bay superstructure (contract No. 7) will require 52,350 tons of structural steel and 650 tons of reinforcing bars.

The Reconstruction Finance Corporation has agreed to purchase $2,350,000 bonds of the city of San Diego, for the completion of the El Capitan dam and for the laying of six miles of 48 in. pipe and two miles of 36 in. pipe.

It appears likely that the construction of the cancer ward and the psychopatic ward in San Francisco will be postponed until next year, although bids are scheduled to be taken on the latter building on Jan. 25.

Steel Interests Oppose Continuance of Freight Rate Surcharges

WASHINGTON, Jan. 24.—"Wage reductions in the steel industry have been far greater than those of the railroads and dividends are only memories of the past."

While declaring it did not want to take an unfriendly attitude toward the rail carriers, the Youngstown Chamber of Commerce thus pointed out the deplorable condition of the steel industry in a statement filed last week with the Interstate Commerce Commission. The statement was filed in connection with the effort of the railroads to have the commission authorize continuance of the surcharges which otherwise will expire on March 31. The Youngstown chamber expressed the view that the surcharges are retarding business, and, while recognizing the need of the carriers for more revenue, it proceeded to show that the steel industry is in a worse shape than the railroads are.

The carriers, the Youngstown chamber said, state that numerous lines are not meeting fixed charges but in some instances are paying dividends on preferred stock. In contrast, it was pointed out, the steel industry is suffering even more than the rail carriers and even a slight increase in freight rates has an adverse effect on operations and ability to sell its products and consequently upon employment conditions.

Operations in the steel and coal industries long have been at a loss, said a protest filed by the Andrews Steel Co., the Newport Rolling Mill Co., and Globe Iron Roofing & Corrugating Co., Newport, Ky., and the Hardy-Burlyham Mining Co., Hardburly, Ky.

Illustrative of the drastic falling off of steel business, the production figures in percentage of capacity of the Andrews Steel Co. were given for the period from 1929 to 1932. They were: 1929 — 87.18; 1930 — 48.32; 1931 — 28.57; 1932—22.30.

The production of the Newport Rolling Mill Co. in gross tons was given as follows: 1929—159,510; 1930—114,098; 1931—72,629; 1932—53,369.

"The decrease in production of iron and steel articles has naturally been accompanied by steadily rising unit costs, while the selling prices of the commodities produced have been constantly going down," the statement said. "The result is a situation which calls (if the industries are to survive) not only for a discontinuance of the emergency freight charges but for numerous other readjustments of freight rates to restore previous relationships and iron out inequalities."

River Movement of Steel Fell Sharply in 1932

Movement of iron and steel products on the Ohio River in the Pittsburgh district during 1932 amounted to 418,990 net tons, according to the United States Engineer Office, Pittsburgh. This compares with 746,448 net tons in 1931 and with 1,236,906 tons in 1930, when the highest annual movement was recorded. Ohio River shipments in 1929 amounted to 1,212,912 net tons. On the Monongahela River 284,954 tons of iron and steel products were moved last year, as compared with 471,881 tons in 1931, 1,138,950 tons in 1930, and 1,203,727 tons in 1929, the highest on record. Allegheny River shipments of iron and steel products were the highest in recent years, having amounted to 67,117 tons, as compared with 20,882 tons in 1931, 44,075 tons in 1930, and 2507 tons in 1929. The heavy movement last year was largely accounted for by shipments of pig iron from Ohio River furnaces to a steel maker on the Allegheny River.

Iron and steel shipments on the Ohio River in the Pittsburgh district during December amounted to 30,048 net tons, as compared with 45,735 tons in the preceding month, and with 51,138 tons in December, 1931. Monongahela River shipments amounted to 28,169 tons, as compared with 29,851 tons in November, and with 21,360 tons in December, 1931. On the Allegheny River, 7200 tons of iron and steel were moved last month, as compared with 23,225 tons in the preceding month. There was no movement in December, 1931.

Buffalo Pig Iron Sales in Carlots Gain

BUFFALO, Jan. 24—The total tonnage of pig iron sold during the past week was small, but there was an increase in carload sales. Indications are that more foundries are melting than in several months.

Steel

The Lackawanna plant of Bethlehem Steel continues to operate five open-hearths. Republic Steel lighted two furnaces last Thursday which will operate until Thursday of this week. Wickwire Spencer is operating one furnace. The Seneca division of Bethlehem is operating at 18 to 20 per cent.

Scrap

The only transaction of consequence during the week was a sale of 250 tons of stove plate at $7.25. The market is firmer.

Chicago Steel-Making Rate Rises Sharply to 14 Per Cent

Greater Number of Diversified Orders Give Mills a Better Operation—Retail Wire Trade Improving

CHICAGO, Jan. 24 — Growth in steel specifications a week ago are now reflected in ingot production, which has turned upward rather sharply to an average of 14 per cent of capacity. Current sales and specifications are steady and the outlook for February is improved.

Automobile manufacturers still give major support to the market, but the greater number of miscellaneous orders is encouraging. Demand for finished steel is more diversified and mill schedules are not quite so difficult to arrange.

The demand for farm implements is more pronounced, and it is openly stated that output could expand were it not for caution due to the credit situation.

New rail releases are at hand, and track accessories are moving at the rate of last July and August. Much track work is urgent and open weather is permitting section gangs to carry on.

The retail wire trade is improved, a harbinger of spring that was absent a year ago at this time. Pressure against prices remains an important factor, as most sellers acknowledge that the field is open and they are meeting competition as it exists.

Pig Iron

Two developments in this market point to betterment. In the first place, inquiries are individually larger and sales are taking the same course. In the second place, releases continue their upward course and still greater improvement is in sight for the early part of February. Prices for Northern foundry iron are steady in and near Chicago, but consumers to the South and beyond the line where freight rates equalize are obtaining concessions.

Bolts, Nuts and Rivets

Although moderate releases have come from manufacturers of farm equipment, total releases are small and January bids fair to be near a par with August, which was the low point for the industry.

Bars

Miscellaneous business is increasing slowly, but individual tonnages remain small. Demand from automobile manufacturing centers is steady and farm implement manufacturers, though taking small quantities of steel, find their production schedules could be materially larger if they were willing to extend more liberal credit. Inquiries for small lots of bars are decidedly more numerous.

Cast Iron Pipe

This market is extremely quiet. There is little in prospect, except from Chicago, and sellers do not believe winter buying prices would stimulate bookings. Progress is being made on plans for the Chicago water works and it may be a matter of only a few weeks before specifications reach the trade. Contracts have been let for the Wilmette, Ill., water works, but actual work has not yet started. C. E. Carlson, Chicago, has the general contract at Springfield, Ill.

Reinforcing Bars

Several public lettings constitute the bulk of transactions in this market. Inquiries remain light, though projects being considered are more numerous. The new administration in Illinois is now letting contracts for road and bridge work. Brewery projects are shaping, but it is doubtful if any large sums will be spent before beer is assured by Congressional action. Prices for reinforcing bars remain weak.

Cold-Rolled Strip

Output has been raised about four points to 19 per cent of capacity as a result of demand from automobile manufacturers.

Rails and Track Supplies

Production of rails is moderately heavier as the result of releases against old commitments. New business is lacking. Specifications for track accessories are still growing and have now reached about the proportions of last July and August. This situation is unusual in midwinter, but the weather has been unusually open and some track work is very urgent.

Wire Products

A distinctly encouraging note has been struck in this market by the revival of retail trade in many agricultural sections of the country. Jobbers remain inactive, but retailers are entering orders at mills, and the whole situation appears to be one in which the dominant factor is not the need of wire products but rather where to give credit when requested. The volume of these orders is sufficient to assure an early upturn in production. In the meantime releases by automobile manufacturers are steady. Public utilities are taking only limited quantities of copper wire for maintenance purposes.

Sheets

Pressure against sheet prices remains severe and quotations are weak. Galvanized sheets at Chicago mills are quotable at 2.65c. to 2.75c. a lb. and No. 24 hot-rolled annealed sheets are not bringing more than 2.10c. It is reported here that automobile manufacturers' attempts to substitute cheaper finishes for automobile body sheets have been abandoned. In general, consumers are reluctant to enter the market except for small quantities.

Structural Material

A fair sprinkling of public jobs, mostly highway bridges, accounts for about all of the activity in this market. Bids are again being taken on the St. Paul post office, and the controversy between the State and the Chicago & Alton Railroad concerning the Justice Park, Ill., viaduct is at an end. However, the Burlington Railroad still has work blocked on dam construction on the Mississippi River in Wisconsin. Railroad work is confined to a few very small repair jobs.

Plates

Tonnages pending a week ago are still open and no new business of note has come before the trade. Several small tank jobs for oil companies have helped shop operations. Hartland, Wis., is taking bids on a 60,000-gal. water tank and tower.

Scrap

A local steel company has bought over 5000 tons of heavy melting steel at $5.50 a ton, delivered, and other consumers are scanning the market more closely. On the whole, the market appears to be tightening both as to supplies and as to prices. The Santa Fe is still holding back its list, but the Milwaukee road is offering 5000 tons. An order for old cast iron borings is still out, but pressure is lighter against this grade and prices are less firm.

Cincinnati Pig Iron Trade in Small Lots

CINCINNATI, Jan. 24 — Pig iron bookings the past week totaled less than 400 tons, all in carload lots. Inquiries also are for small amounts, since consumers are reluctant to consider purchases beyond current needs. Stove foundry operations are at fair level, but some tapering in automotive work is reported.

Scrap

The scrap market is featureless. Small orders for sudden needs make up the bulk of new business. Readjustment of quotations on No. 1 machinery cast and No. 1 railroad cast was made the past week, but prices are nominal.

Eastern Pennsylvania Orders Light; Prices Are Easier

Plates Quoted at 1.50c. to 1.70c., Coatesville; Shapes at 1.60c., Eastern Mill—Operations Up Slightly

PHILADELPHIA, Jan. 24.—Steel makers see no signs of an early upturn in the market. Orders are extremely light and efforts to book such tonnages as are coming out have weakened the price structure further. The softer tone is especially noticeable in wire products, sheets, cold-rolled strip steel, reinforcing bars and plates. The point has been reached where it is difficult to ascertain the price levels. Meanwhile bright wire is quoted at 2.10c. to 2.20c., hot-rolled sheets No. 10 at 1.45c. to 1.55c., cold-rolled strip at 1.90c. to 2c. and galvanized sheets No. 24 at 2.65c. to 2.75c., Pittsburgh. Plates are quoted at 1.50c. to 1.70c., Coatesville, and structural shapes at 1.60c., Eastern mills. The price of 1.70c. on plates applies to small lots generally. Merchant bars are holding fairly well at 1.60c., Pittsburgh.

Operations of steel work were increased 1½ points to 12 per cent today when a nearby plant lighted two open-hearth furnacse. The same plant at the same time started one large and one small shape mill, while yesterday it started a blooming mill. The capacity was put into operation to roll on orders and stocks. Unless sufficient new business comes in, the added operations will continue only for three or four days.

Except for a bid of $2.25 from a small maker, the regular price of $2.40 per keg was quoted on 5000 kegs of spikes for the Pennsylvania Railroad.

Pig Iron

Orders continue in about the same volume as that prevailing since the first of the year, and are confined chiefly to carlots.

Plates, Shapes and Bars

Demand is extremely dull, with the price level on plates becoming noticeably easier. Plates now take a range of 1.50c. to 1.70c., Coatesville, the higher level being for small lots. Sales of larger tonnages have been made at the lower quotation. Shapes are quoted generally at 1.60c., Eastern mill. Merchant bars show a steady tone at 1.60c., Pittsburgh. The market for reinforcing bars is irregular and softer. The Belmont Iron Works has been awarded 700 tons for the Market Street viaduct in Philadelphia and 2500 tons for a Federal Government central heating plant in Washington.

Sheets

Releases from automobile body builders are proving to be smaller than had been expected. Since the automotive industry is the most important consumer, the mills find aggregate orders are exceptionally small and efforts to book tonnages have brought considerable irregularity in both sheets and cold-finished strips.

Warehouse Business

Jobbers are somewhat encouraged over a slight increase in releases the past week. Inventories have been reduced slightly and, while orders still are being withheld, indications are that further releases to the mills are about to be made.

Imports

Fifty tons of spiegeleisen from England was the only importation in the iron or steel classification received at Philadelphia the past week.

Scrap

No. 2 heavy melting steel has developed a firmer tone at $5 to $5.50 as the result of a round tonnage at the latter figure to an eastern Pennsylvania plant the past week. A fair tonnage of carwheels was sold to a nearby mill at $8.50.

Birmingham Pig Iron and Steel Sales Gain Slightly

BIRMINGHAM, Jan. 24.—A slight gain in pig iron shipments, as compared with the movements of several preceding weeks, was registered last week. The increase was unimportant and has not changed the complexion of the market, which has been almost at a standstill since mid-December.

Foundry operations are still far from their pre-holiday rate, but indications point to a moderate improvement next month. Particularly is this true of pipe. Inquiries have been better during the last two weeks. Pending and prospective tonnage awards are sure to provide more business for February production than has been available for this month. Iron quotations are holding to $11, base, for the Southern market.

Two blast furnaces continue in production, one on basic iron and one on foundry. Unless there is some definite improvement in the market the one on foundry may be banked. The Woodward Iron Co., which banked two furnaces in December, and the Republic Steel Corpn., which banked one, have no plans for resumption within the next few weeks.

Both steel manufacturers in this district report small gains in bookings for the past week. January volume to date is also ahead of that booked in the same period in December. Building lines lead the current demand. Prices for finished steel are unchanged but wire products have been reduced. Fence is down $5 a ton; nails and staples, $3; barbed wire, $6; fence, $5; bright and annealed smooth wire, $2; galvanized smooth wire, $4; wire rods, $2.

There is talk of the Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. being reopened on a light schedule some time soon, but no official statement has been made. No substantial tonnages have been placed by the railroads, but there have been small accumulations. These are not sufficient for the operation of the Ensley blast furnaces and open-hearths, and it is planned to take steel from the Fairfield works. The Ensley rail mill has not operated since May 21.

Five open-hearths were active last week in this district and the same number is being worked during the current week.

St. Louis Steel Output Rises to 14 Per Cent

ST. LOUIS, Jan. 24.—Agricultural implement interests in the St. Louis territory are hopeful that legislation in Washington will stimulate buying in these lines. Stocks of pig iron of foundries serving the industry are almost exhausted. Stove plants are operating on the least possible scale; those outside of St. Louis are said to be doing better than those here. Miscellaneous carload orders comprise the bulk of the pig iron business.

Steel

Two additional open-hearth furnaces were started up this week, operations now being at about 14 per cent of capacity.

The Granite City Steel Co. reports that it found that inventories as of Dec. 31 "were not only low, but dangerously low," and in many cases fabricators were using sizes that resulted in an exorbitant amount of waste.

Scrap

The first 1933 buying of scrap of any considerable tonnage was reported this week. One mill bought between 5000 and 7000 tons of heavy melting and shoveling steel and another bought approximately 3000 tons. A round tonnage of stove plate also was purchased. The latter item is off 50c. a ton, but the remainder of the list is nominally unchanged. Railroad lists are small, as follows: New York, Chicago & St. Louis, 14 carloads, and Mobile & Ohio, 3 to 6 carloads.

Cleveland Steel Production Gains on Automotive Orders

Rate Rises to 44 Per Cent Because of Bar and Sheet Business—Miscellaneous Buying Slightly Better

CLEVELAND, Jan. 24 — There was a slight further gain in miscellaneous orders for finished steel during the week, but the improvement was not sufficient to indicate a definite uptrend.

With improved demand from the automotive industry for bars and sheets, the Corrigan, McKinney Steel Co. this week put on a fifth open-hearth furnace, increasing the ingot output in Cleveland to 44 per cent of capacity.

Not a great deal of new business came from the automobile manufacturers. However, sheet mills and some of the hot strip mills have enough tonnage on their books to permit them to maintain the operation schedules of the previous week. Some of the leading automobile companies have announced tentative production schedules for February which indicate little change from their January schedules. The Ford Motor Co. has inquiries out for the parts for its new models.

The Chesapeake & Ohio and Erie railroads have not yet decided on the tonnages of rails they will purchase for 1933 and their inquiries probably will not be out for several weeks.

The announced price reductions on wire products are being generally met by producers, but lower prices have not stimulated sales. Sheets generally have settled to the lower price basis, but no further concessions are reported.

Pig Iron

Sales still are confined to small lots for early needs and little inquiry is pending. One producer sold 1500 tons during the week, but not much business was taken by other furnaces. Buying in this territory is negligible. Foundry operations generally have not improved. Shipments are still ahead of those of December. Shipping orders are holding up well from automotive foundries, but have declined from plants specializing on stamping dies for the automotive industry. Prices are unchanged.

Bars, Plates and Shapes

Orders for steel bars show a gain, most of the business coming from the automotive industry, which placed some fair-sized lots during the week. Structural inquiry is light. Only two local awards are reported aggregating 400 tons for work in other districts. Merchant bars are firm at 1.65c., Cleveland, and structural shapes and bars are holding at 1.60c., Pittsburgh. However there has been little test recently of the latter price.

Bolts and Nuts

Demand is confined largely to orders from the automotive industry, although some business is coming from the railroads. Shipments are in about the same volume as in December. Makers do not expect that prices will be affected by the reduction on wire as small bolts were reduced 10 to 15 per cent in the revised price lists put out in December.

Sheets

New business from the automotive industry declined the past week, but the demand from other sources improved slightly, perhaps being stimulated somewhat by the price reductions. Some of the mills have enough tonnage on their books from motor car manufacturers to maintain recent operations this week. Some additional business has come from the refrigerator industry. Prices appear to be fairly well stabilized at the recent reductions, with minimum quotations of 2c. Pittsburgh for hot-rolled annealed sheets and 2.30c. for light cold-rolled sheets.

Strip Steel

Not much new business was placed during the week and some of the automotive interests did not issue new releases, although they are still taking material against old specifications. Orders from other sources are light.

Scrap

A local mill continues to take a moderate amount of open-hearth and blast furnace scrap, but not much, if any, is being taken by consumers in the Valley district. No new consumer demand has developed. Prices are unchanged but nominal.

Steel Gains in Valleys Have Been Small

YOUNGSTOWN, Jan. 24—While seasonal improvement in orders has not been entirely denied Valley mills, the increase over December has been extremely limited with most companies, while some have barely held their own. Orders for sheets, strip steel and bars from the automotive industry, which were comparatively heavy last month, held up rather well in the first half of January, but the recent tendency has been toward curtailment. The larger automobile manufacturers, with the exception of the Ford Motor Co., have now largely completed their advance production on new models, and future steel releases from this source seem to depend upon consumer purchases of cars.

Demand for pipe has just about held its own, but producers report more interest on the part of buyers in the last week or two, in spite of the fact that definite inquiry is slow to appear.

Local consumers of steel products have not increased their requirements materially since the first of the year, but the Truscon Steel Co. is negotiating for a large sheet tonnage for refrigerator cabinets. Steel furniture makers are still operating at a low rate, and producers of sheet metal stampings have not increased their output materially. Fabricators of barrels and tanks for the oil industry are marking time.

Steel ingot production in the Valleys has ranged from 15 to 20 per cent of capacity thus far in the month, but has been supported to a considerable extent by tin plate mills. Only one or two plants have maintained very consistent schedules, with others varying their number of active furnaces from day to day. Blast furnace schedules are also intermittent. A merchant furnace which recently went into operation is producing iron for an ingot mold plant.

Canadian Industry is Still Marking Time

TORONTO, Jan. 23—While the automotive industry has created some improvement in the Canadian iron and steel industry, new business as a whole is without feature. Building trades are practically at a standstill and there are no large construction programs in sight. Slackness in the building trades is reflected in almost total suspension of operations by radiator companies and sanitary ware plants. Foundries and machine shops are operating at intervals on schedules of two or three days a week, with a few on full-time production.

Steel mills are doing little, with the exception of the Dominion Steel & Coal Co., Sydney, N. S., which is producing rails against a 15,000-ton order for the Canadian National. Local interests estimate operations for most branches of the steel industry at between 10 and 12 per cent.

Detroit Scrap Market

DETROIT, Jan. 24—Scrap purchases the past week consisted of small lots, the largest volume having been in borings and turnings. The price of borings and short turnings and of long turnings advanced 25c. a ton as the result of this activity. Otherwise, quotations are unchanged.

New York Steel Business Is Barely Holding Its Own

No Important Gain in Volume This Month—Inquiries More Numerous—Sheet Prices Still Weak

NEW YORK, Jan. 24.—Although some steel companies have had slightly more business in this territory in January than they received in December, the past week has brought no particular improvement over the preceding week. Declines in prices of sheets and wire products have brought no increased demand for those items.

No further weakness in wire products is reported, but sheet prices are variable and not readily defined. On galvanized sheets, for example, the usual quotation is 2.65c. a lb., Pittsburgh, but some sales are being made at 2.60c. Jobbers have taken carload business at 2.65c. No. 24 gage box annealed sheets seem to be holding at a range of 2c. to 2.10c., with the higher figure quoted on ordinary lots. Vitreous enameling stock is off $2 a ton. Weakness continues in heavy cold-rolled sheets. Cold-rolled strip steel is quite freely available at 1.90c., Pittsburgh or Cleveland.

Inquiries for various steel products have improved with some companies even though orders have not. Some private building work is making an appearance. The National Biscuit Co. will build a $550,000 warehouse at Tenth Avenue and Fifteenth Street, New York, and the Prudential Insurance Co. of America has plans for model tenements in Newark, N. J., in addition to some on which work was recently begun.

Pig Iron

Trading continues in restricted volume. A tapering off in spot carload buying was reflected in bookings of only 600 tons last week, compared with 1000 tons in the preceding period and 700 tons a fortnight ago. No specific inquiry is before the trade. Prices, in the absence of any market influences, are nominally unchanged. Manchurian pig iron, which has recently been offered for delivery in Brooklyn at a price below prevailing competition, has thus far failed to arouse buying interest here.

Reinforcing Bars

Fresh demand for bars is mostly for miscellaneous small lots. A bridge at the naval training station, Newport, R. I., will require about 100 tons. Other projected work on which bar requirements have not yet been established includes an officers' apartment building at Fort Jay, N. Y.; an addition to the Army hospital, Fort Monmouth, N. J., and a laundry building at Mount Vernon, N. Y. Weakness in prices is still acute, with foreign competition the outstanding depressing influence in this district.

Scrap

Further pressure from dealers who are seeking to cover against standing export orders has pushed prices for No. 1 and No. 2 heavy melting steel to $5 and $3.50 a ton, on barge, respectively. The No. 1 grade is still being loaded for shipment to Japan, while the No. 2 grade is being accumulated for export to Italy. Demand from domestic consumers is still lagging.

Japan is Buying Steel Freely in Continental Markets

LONDON, ENGLAND, Jan. 23 (*By Cable*).—British steel business is quiet. Makers have reaffirmed controlled prices and have decided to continue existing selling organizations.

Tin plate demand is also quiet, but there is a fair volume of inquiry. Current output is about 65 per cent of capacity. Last year's output of tin plate was 678,000 tons. The output of terne plate and black plate was 756,000 tons.

Continental steel is firm on continuance of Far Eastern demand. Japan is buying all kinds of steel, including semi-finished. Full gold prices are being obtained on all export business, but lower figures have to be accepted for sales to the United Kingdom to meet British competition.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9		
Billets, open-hearth	£4 17s. 6d	to £5 7s.	6d.
Black sheets, Japanese specifications	£11		
Tin plate, per base box	15s. 9d.	to 16s.	
Steel bars, open-hearth	£7 17½s.	to £8 7½s.	
Beams, open-hrth.	£7 7½s.	to £7 17½s.	
Channels, open-hearth	£7 12½s.	to £8 2½s.	
Angles, open-hearth	£7 7½s.	to £7 17½s.	
Black sheets, No. 24 gage	£8 5s.		
Galvanized sheets, No. 24 gage	£10 10s.	to £10 15s.	

Continental Prices f.o.b. Continental Ports

Per Metric Ton, Gold £ at $4.86

Billets, Thomas	£2 2s.		
Wire rods, No. 5 B.W.G.	£4 10s.		
Black sheets, No. 31 gage, Japanese	£11 5s.		
Steel bars, merchant	£2 8s.	to £2 10s.	
Beams, Thomas	£2 3s.		
Angles, Thomas, 4-in. and larger	£2 8s.		
Angles, small	£2 10s.		
Hoops and strip steel over 6-in. base	£3 7s.	6d. to £3 10s.	
Wire plain, No. 8.	£5 7s.	6d.	
Wire nails	£5 10s.		
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.		

The Soviet Government is trying to buy 20,000 tons of steel bars in Czechoslavakia on two years' credit.

Cleveland pig iron for home consumption in England is now quoted at 62s. 6d., delivered Northeast Coast for No. 3 iron.

Ougree Marihaye of Belgium has obtained control of the Hainaut Works, thereby securing a larger output quota in the Raw Steel Cartel.

Seek Closer Cooperation

(Concluded from Page 176)

to 1,400,000 tons. Last year the figure was still larger, despite the fact that there has been a reduction in the industry's total manufacturing capacity of about 100,000 tons a year in the last three years.

Malcolm W. Bingay, editorial director, Detroit *Free Press*, Detroit, was the guest speaker at the luncheon meeting of the society. He attacked the claims of Technocracy and criticized its policies.

T. H. Harvey, Ohio Steel Foundry Co., Lima, Ohio, was elected president of the society for the coming year. Other officers named were: G. R. Casey, Treadwell Engineering Co, Easton, Pa., vice-president and chairman of the Eastern division; E. L. Brooks, Sawbrook Steel Casting Co., Cincinnati, vice-president and chairman of the Central-Atlantic division; F. A. Lorenz, Jr., American Steel Foundries, Chicago, vice-president and chairman of the Midwest-Southern division; H. E. Muchnic, Locomotive Finished Material Co., Atchison, Kan., vice-president and chairman of the Mid-Continent division; and R. E. Noak, Monarch Foundry & Engineering Co., Ltd., Stockton, Cal., vice-president and chairman of the Pacific Coast division. Directors elected were: Keith Williams, Pratt & Letchworth Co., Buffalo, division one; W. E. Trump, Machined Steel Casting Co., Alliance, Ohio, division two; Arthur Simonson, division three; and E. S. Dilley, Standard Brake Shoe & Foundry Co., Pine Bluff, Ark., division four.

Fabricated Structural Steel

Awards Slightly Higher—New Projects Decline

BOOKINGS of fabricated structural steel, at 9100 tons, were slightly in excess of those of the previous week, which totaled 8655 tons. Awards were mostly for public work, the largest, 2500 tons, for a Government central heating plant at Washington. New projects call for 5000 tons and include no large jobs. This total compares with 65,500 tons a week ago, which included 62,000 tons for the San Francisco-Oakland bridge. Awards follow:

NORTH ATLANTIC STATES

Boston, 400 tons, ventilation building, East Boston tunnel, to New England Structural Co.

Machias, Me., 100 tons; State bridge, to Lackawanna Steel Construction Corpn.

Pittsfield, Mass., 140 tons, State highway bridge, to McClintic-Marshall Corpn.

Willard, N. Y., 150 tons, State hospital, to McClintic-Marshall Corpn.

Binghamton, N. Y., 110 tons, city garage, to Leech Steel Corpn.

Ulster County, N. Y., 450 tons, bridge at Saugerties, to Lackawanna Steel Construction Corpn.

Wassaic, N. Y., 215 tons, State school, to Bethlehem Fabricators, Inc.

Poughkeepsie, N. Y., 200 tons, New York Central railroad bridge, to American Bridge Co.

Philadelphia, 680 tons, Market Street viaduct, southside, to Belmont Iron Works.

Lickdale, Pa., 180 tons, State highway bridge, to McClintic-Marshall Corpn.

Washington, 160 tons, lintels for Department of Justice Building, to Belmont Iron Works.

Washington, 200 tons, recipitator for Research Corpn., to Lackawanna Steel Construction Corpn.

Washington, 2500 tons, Government central heating plant, to Belmont Iron Works.

SOUTH AND SOUTHWEST

Clarksville, Va., 600 tons, bridge, to Wisconsin Bridge & Iron Co.

State of Tennessee, 840 tons, lock and dam No. 3, Tennessee River, to Treadwell Construction Co.

Ponca City, Okla., 230 tons, post office, to J. B. Klein Iron & Foundry Co.

CENTRAL STATES

Homer, Mich., 100 tons, State bridge, to Lackawanna Steel Construction Corpn.

Chicago, 125 tons, building for Firestone Tire & Rubber Co. at World's Fair, to Hansell-Elcock Co.

Chicago, 100 tons, horticultural building at World's Fair, to Mississippi Valley Structural Steel Co.

Tiskilwa, Ill., 100 tons, bridge, to Wisconsin Bridge & Iron Co.

Keokuk, Iowa, 700 tons, bridge, to Clinton Bridge Co.

WESTERN STATES

Stockton, Cal., 240 tons, San Hoquian River bridge, to Moore Dry Dock Co.

Midland, Cal., 250 tons, United States Gypsum Co. plant, to Austin Co., steel to be fabricated in Cleveland.

San Francisco, 105 tons, bridge, for Pacific Electric Co., to Consolidated Steel Co.

Canal Zone, 200 tons, structures, to Bethlehem Steel Export Corpn., United States Steel Export Corpn. and Central Iron & Steel Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

New London, Conn., 400 tons, post office.

New York, 9000 tons, Federal court house; James Stewart & Co., Inc., New York, awarded general contract for granite structure.

Rochester, N. Y., 300 tons, State hospital.

Washington, 175 tons, vaults for Treasury building.

SOUTH AND SOUTHWEST

Daytona Beach, Fla., 200 tons, post office.

Norfolk, Va., 107 tons, marine hospital.

State of Florida, 925 tons, beam spans for highway department.

Tyler, Tex., 375 tons, post office.

CENTRAL STATES

Chicago, 150 tons, Cook County hangar for Goodyear Tire & Rubber Co.

WESTERN STATES

State of Colorado, 250 tons, highway bridge.

San Francisco, 4000 tons, Federal office building, bids Feb. 28, previously reported as 2500 tons.

San Jose, Cal., 450 tons, post office, bids Feb. 17.

FABRICATED PLATE

AWARDS

Pittsburgh, 490 tons, Locks 2 and 3 on Allegheny River at Aspinwall and Springdale, Pa., to Dravo Contracting Co.

Omaha, Neb., 210 tons, tunnel liner plates, to Commercial Stamping Co.

Avon, Cal., 600 tons, tanks for Associated Oil Co., to Western Pipe & Steel Co.

Paducah, Ky., 1500 tons, 10 barges for West Kentucky Coal Co.

Mobile, Ala., 180 tons, two barges for United States Engineer; bids Feb. 14.

Chicago, 100 tons, whirler derrick boat for United States Engineer; bids Feb. 2.

Hartland, Wis., unstated tonnage, one 60,000-gal. steel water tank on steel tower with balcony 75 ft. above foundation; bids close Jan. 28.

Cast Iron Pipe

Boston closed bids Jan. 18 on 1200 tons of 8 to 16-in. Class B. Warren Foundry & Pipe Corpn., low bidder, figuring on water delivery.

Memphis, Tenn., has awarded 350 tons of 6 and 12-in. to United States Pipe & Foundry Co.

Santa Cruz, Cal., will take bids Jan. 30 on 129 tons of 4 and 8-in. class B.

San Francisco will call for bids about Feb. 15 for 410 tons of 10-in.

Oakland, Cal., will take bids Jan. 27 for 570 tons of 6-in. class 250.

Pipe Lines

Lycoming Producing Corpn., Pittsburgh, affiliated with Lycoming Natural Gas Co., plans new 20-in. natural gas welded steel pipe line from Farmington Township gas fields, Tioga, Pa., to gas properties in Hebron, Pa., about 40 miles, to tie in with company trunk line from first noted place to Syracuse, N. Y., and vicinity. Cost about $125,000.

Texas Corpn., Houston, Texas, is considering new natural gas steel pipe line from Lea to Hobbs, Texas, about 24 miles.

Missouri-Kansas Pipe Line Co., 10 South La Salle St., Chicago, is considering a welded steel pipe line from Illinois State line to Indianapolis, where natural gas franchise has been asked. New line will connect with system of Panhandle Eastern Pipe Line Co., in which Missouri-Kansas company has interest. Cost over $500,000.

Peoples Gas & Electric Co., Mason City, Iowa, plans installation of steel pipe line for extension in gas system at plant of American Beet Sugar Co.

Reinforcing Steel

Awards 1800 Tons—New Projects 1000 Tons

State of Rhode Island, 100 tons, State bridge, to Joseph T. Ryerson & Son, Inc.

State of Connecticut, 100 tons, State bridges, to Concrete Steel Co.

Rome, N. Y., 175 tons, State school, to a Buffalo bidder.

Binghamton, N. Y., 175 tons, armory, to a Buffalo bidder.

Shreveport, La., 100 tons, officers' quarters at Government air field, to Laclede Steel Co.

Oak Park, Ill., 150 tons, post office, to Inland Steel Co.

Chicago, 325 tons, Foster Avenue bridge, to Inland Steel Co.

Milwaukee, United States Engineer Office, 105 tons, to Joseph T. Ryerson & Son, Inc., and Concrete Steel Co.

Alameda County, Cal., 226 tons, State highway between Dublin and Castro Hill, to Truscon Steel Co.

San Diego, 100 tons, State Teachers College gymnasium, to Western Pipe & Supply Co.

San Diego, 200 tons, tunnel at Navy Base, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Newport, R. I., 100 tons, bridge at naval training station.

Fort Jay, N. Y., unstated tonnage, officers' apartment building.

Fort Monmouth, N. J., unstated tonnage, addition to army hospital.

Mount Vernon, N. Y., unstated tonnage, laundry building.

Washington, 472 tons, Treasury vaults, bids to be opened Feb. 2.

Fort Sill, Okla., 960 tons, army barracks, Jerome Utley, general contractor.

Lexington, Ky., 1000 tons, Government narcotic farm buildings, Great Lakes Construction Co., general contractor.

Santa Maria, Cal., 100 tons, reservoir, bids under advisement.

Beverly Hills, Cal., 150 tons, post office, general contract awarded.

Clatsop and Jackson Counties, Ore., 104 tons, State highway bridges; bids Feb. 25.

Railroad Equipment

Chicago, Burlington & Quincy has awarded contract for three 60-ton Diesel electric switching locomotives to the Midwest Locomotive Works.

City Machine & Tool Works, Dayton, Ohio, is completing an order for 21 Peerless chamfering machines placed by Dodge Brothers Corpn., division of Chrysler Corpn., Detroit. These machines are being used for the rounding of gear teeth in all Chrysler transmissions and in the new Dodge all-helical gear transmission.

Tin Higher on Rise in Sterling; Lead Demand Improves; Copper Dull

NEW YORK, Jan. 24.—The complexion of the domestic copper market is unchanged. Infrequent purchases of spot lots of electrolytic are being made at the prevailing quotation of 5c. a lb., delivered Connecticut, while little or no interest is being displayed in second quarter metal at a premium of ⅛c. Primary producers with affiliated fabricating units are still adhering to their posting of 6.25c. Demand from European consumers is steady. On the strength of a relatively sharp rise in sterling exchange, export copper values rose today to 5c. to 5.10c., c.i.f. usual Continental ports, with moderate sales reported at these levels. In the fore part of the past week prices for foreign delivery reflected somewhat easy tendencies, having sagged to as low as 4.90c. While reports from abroad persist that foreign producers contemplate further discussions dealing with a possible accord on curtailed production schedules for the remainder of the year, evidences of definite steps in that direction are still absent.

Lead

Buying in the past week was the most active since the beginning of the year. Spot covering comprised the bulk of transactions. While February contracting is still restricted, there is a growing interest in forward metal. Prices are steady and unchanged at 2.87½c. a lb., St. Louis, and 3c., New York. Production of lead in December, according to statistics, amounted to 24,800 tons, against shipments of 23,800 tons, resulting in a 1000-ton increase in producers' stocks.

Tin

Spot Straits tin was quoted today at 23c. a lb., New York, representing a net advance of 30 points for the week. This gain was occasioned largely by higher sterling, which today reached $3.40. With sterling still inclined toward higher levels, sellers are content to limit offerings of tin. Buyers, on the other hand, though undoubtedly displaying broader interest as a result of rising values, are still covering sparingly against their requirements. A fairly strong undertone prevails also in the London market. Prices there, however, fluctuated narrowly during the week, with today's postings, £145 12s. 6d. a ton for spot standard £146 2s. 6d. for future standard and £151 2s. 6d. for spot Straits. Today's Singapore quotation was £150 5s., compared with £149 10s. a week ago. United Kingdom warehouse stocks dropped 252 tons last week to 28,976 tons.

Zinc

Continued absence of demand and lack of selling pressure hold activity in this market at a minimum. Sales volume in the past week, at less than 1000 tons reflected a shrinkage from that in the preceding period. Prices, however, are apparently steady despite the lack of buying support and are unchanged at 3c. a lb., East St. Louis, and 3.37c., New York.

Japan and Russia Are Seeking Machine Tools

Inquiries for machine tools for shipment to Japan and Russia have appeared during the past week in several sections of the country. The Japanese are primarily interested in used tools.

A Cleveland tool manufacturer has sold 16 automatic screw machines to a Detroit automobile company and reports that the outlook is more favorable than for a long time.

Sheet Sales Increased

Renewed buying by the automotive industry is reflected in an increase in sales of steel sheets during December, according to the monthly report of the National Association of Flat Rolled Steel Manufacturers, composed of independent makers. Sales were 76,962 tons compared with 66,274 tons in November. Both production and shipments declined. Production was 77,489 tons against 90,679 tons during the previous month and shipments were 67,412 tons compared with 76,866 tons in November. Larger sales and lighter shipments resulted in an increase in unfilled orders, which were 84,390 tons on Jan. 1 compared with 77,339 tons on Dec. 1. The December report and comparison in net tons follow:

	Dec.	Nov.	Oct.
Sales	76,962	66,274	94,656
Production	77,489	90,679	108,111
Shipments	67,412	76,866	92,424
Unfilled orders	84,390	77,339	90,707
Unshipped orders	37,245	43,144	45,576
Unsold stock	57,413	60,177	60,257
Capacity per month	550,000	550,000	550,000
Percentage reporting	62.2	62.2	68.4
Percentages, Based on Capacity			
Sales	22.5	19.4	25.1
Production	22.7	26.6	28.7
Shipments	19.7	22.5	24.5
Unfilled orders	24.7	22.7	24.1
Unshipped orders	10.9	12.6	12.1
Unsold stocks	16.8	17.6	16.0

The Week's Prices. Cents Per Pound for Early Delivery

	Jan. 18	Jan. 19	Jan. 20	Jan. 21	Jan. 23	Jan. 24
Electrolytic copper, N. Y.*	4.75	4.75	4.75	4.75	4.75	4.75
Lake copper, New York	5.00	5.00	5.00	5.00	5.00	5.00
Straits tin, Spot, N. Y.	22.62½	22.40	22.62½	....	22.80	23.00
Zinc, East St. Louis	3.00	3.00	3.00	3.00	3.00	3.00
Zinc, New York	3.37	3.37	3.37	3.37	3.37	3.37
Lead, St. Louis	2.87½	2.87½	2.87½	2.87½	2.87½	2.57½
Lead, New York	3.00	3.00	3.00	3.00	3.00	3.00

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel, electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 5.80c. a lb., New York.
Brass ingots, 85-5-5-5, 5.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	25.00c. to 26.00c.
Tin, bar	27.00c. to 29.00c.
Copper, Lake	7.50c. to 8.50c.
Copper, electrolytic	7.25c. to 8.25c.
Copper, casting	7.00c. to 8.00c.
*Copper sheets, hot-rolled	13.62½c.
*High brass sheets	11.00c.
*Seamless brass tubes	13.25c.
*Seamless copper tubes	12.37½c.
*Brass rods	8.50c.
Zinc, slabs	4.37½c. to 4.87½c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig	3.75c. to 4.25c.
Lead, bar	5.25c. to 6.25c.
Lead, sheets	6.75c.
Antimony, Asiatic	8.00c. to 9.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	16.00c.
Solder, ½ and ½	15.50c. to 16.50c.
Babbitt metal, commerical grade	21.00c. to 32.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	27.00c.
Tin, bar	29.00c.
Copper, Lake	6.125c.
Copper, electrolytic	6.125c.
Copper, casting	5.875c.
Zinc, slab	4.25c. to 4.50c.
Lead, American pig	3.75c. to 4.00c.
Lead, bar	7.25c.
Antimony, Asiatic	8.50c.
Babbitt metal, medium grade	16.50c.
Babbitt metal, high grade	31.00c.
Solder, ½ and ½	16.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	3.75c.	4.25c.
Copper, hvy. and wire	3.50c.	4.125c.
Copper, light and bottoms	2.625c.	3.50c.
Brass, heavy	1.625c.	2.125c.
Brass, light	1.25c.	1.75c.
Hvy. machine composition	2.50c.	3.125c.
No. 1 yel. brass turnings	2.125c.	2.50c.
No. 1 red brass or compos. turnings	2.375c.	3.00c.
Lead, heavy	2.125c.	2.50c.
Zinc	1.25c.	1.625c.
Cast aluminum	3.75c.	5.25c.
Sheet aluminum	8.00c.	9.75c.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.91c.
Del'd New York	1.95c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.i.f. Pacific ports	2.10c.

Billet Steel Reinforcing
(as quoted by distributors)

F.o.b. P'gh mills, 40, 50, 60-ft.	1.50c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.50c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.35c. to 1.45c.
F.o.b. Chicago Heights mills	1.50c.

Iron

Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.86c.
Common iron, del'd New York	1.90c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.6935c. to 1.7935c.
F.o.b. Coatesville	1.50c. to 1.70c.
F.o.b. Sparrows Point	1.50c. to 1.70c.
Del'd New York	1.698c. to 1.798c.
C.i.f. Pacific ports	2.00c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7495c.
Del'd New York	1.86775c.
C.i.f. Pacific ports (standard)	2.10c.
C.i.f. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.05c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.

S.A.E. Series Numbers	Alloy Differential per 100 Lbs.
2000 (1¼% Nickel)	$0.25
2100 (1½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and Squares	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

Bars, f.o.b. Pittsburgh mill	1.70c.
Bars, f.o.b. Chicago	1.75c.
Bars, Cleveland	1.75c.
Bars, Buffalo	1.75c.
Bars, Detroit	1.90c.
Bars eastern Michigan	1.95c.
Shafting, ground, f.o.b. mill	1¼ in. 3.00c.
	1-3/16 to 1¼ in. 2.50c.
	1-9/16 to 1⅞ in. 2.35c.
	1-15/16 to 2⅞ in. 2.20c.
	2-15/16 to 6 in. 2.05c.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot-Rolled

No. 10, f.o.b. Pittsburgh	1.45c. to 1.55c.
No. 10, f.o.b. Chicago mill	1.55c. to 1.65c.
No. 10, del'd Philadelphia	1.76c. to 1.86c.
No. 10 f.o.b. Birmingham	1.60c. to 1.70c.
No.10, c.i.f. Pacific Coast ports	2.17½c.

Hot-Rolled Annealed

No. 10, Pittsburgh	1.60c. to 1.70c.
No. 10, Chicago mills	1.70c. to 1.80c.
No. 10 Birmingham	1.75c. to 1.80c.
No. 10, Pacific Coast ports	2.32½c.
No. 10, wrought iron, Pittsburgh	3.60c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.00c. to 2.10c.
No. 24, f.o.b. Ch'go mills	2.10c. to 2.20c.
No. 24, del'd Philadelphia	2.31c. to 2.41c.
No. 24, f.o.b. Birmingham	2.25c. to 2.35c.
No. 24, c.i.f. Pacific Coast ports	2.85c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	1.85c. to 1.95c.
No. 10 gage, f.o.b. Chicago mills	1.95c. to 2.05c.
No. 10 gage, del'd Philadelphia	2.16c. to 2.26c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.30c. to 2.40c.
No. 20 gage, f.o.b. Chicago mills	2.40c. to 2.50c.
No. 20 gage, del'd Philadelphia	2.61c. to 2.71c.

Note: Automobile body stock and steel furniture sheets to be quoted henceforth on cold-rolled sheet base prices, with extras for drawing quality.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.65c.
No. 24, f.o.b. Chicago mills	2.65c. to 2.75c.
No. 24, del'd Philadelphia	2.96c.
No. 24, f.o.b. Birmingham	2.80c.
No. 24, c.i.f. Pacific Coast ports	3.50c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. Pittsburgh	2.60c. to 2.70c.

Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh	2.40c. to 2.50c.
No. 20, f.o.b. Pittsburgh	2.90c. to 3.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.20c. to 2.30c.
No. 28, Chicago mill	2.30c. to 2.40c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	$4.25
Standard cokes, f.o.b. Gary	4.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$9.50
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.10
30-lb. coating I.C.	14.90
40-lb. coating I.C.	16.70

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., Pittsburgh	1.45c.
All widths up to 24 in., Chicago	1.55c.
Cooperage stock, P'gh	1.55c. to 1.60c.
Cooperage stock, Chicago	1.65c. to 1.70c.

Cold-Rolled Strips

F.o.b. Pittsburgh	1.90c. to 2.00c.
F.o.b. Cleveland	1.90c. to 2.00c.
Del'd Chicago	2.20c. to 2.30c.
F.o.b. Worcester	2.05c. to 2.15c.
Fender stock, No. 20, gage, Pittsburgh or Cleveland	2.55c. to 2.65c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)
Extras of 10c a 100 lb. on mixed and joint carloads, 25c. on pool carloads and 40c. on less than carloads are applied on all merchant wire products.)

To Manufacturing Trade

Bright wire	2.10c. to 2.20c.
Spring wire	3.10c. to 3.20c.

To Jobbing Trade

	Base per Keg
Standard wire nails	$1.80 to $1.95
Smooth coated nails	1.80 to 1.95
Galvanized nails	3.30 to 3.40

	Base per Lb.
Smooth annealed wire	2.25c. to 2.35c.
Smooth galvanized wire	2.60c. to 2.70c.
Polished staples	2.50c. to 2.60c.
Galvanized staples	2.75c. to 2.85c.
Barbed wire, galvanized	2.30c. to 2.40c.
Woven wire fence No. 9 gage, per net ton	$50.00 to $55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	55.00 to 60.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $3 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Wrought Iron Inches	Wrought Iron Black	Wrought Iron Galv.
⅛	51½	28½	⅛	+95	+142½
¼ to ⅜	57	34	¼ & ⅜	+5	+29¼
½	62	49½	½	28	10½
¾	65½	55	¾	33	16½
1 to 3	67½	57	1 & 1¼	36	20½
			1½	40	23
			2	38	21

Lap Weld

2	61	50½	2	26	12¼
2½ to 6	64½	54	2½ to 3½	33	18½
7 and 8	62	51	4 to 6	35	22
9 and 10	60	49	7 and 8	34	21½
11 and 12	59	48	9 to 12	31	16½

Butt Weld, extra strong, plain ends

⅛	48	33	⅛	+17	+49½
¼ to ⅜	53½	38½	¼ & ⅜	+7	+41
½	59	49½	½	28	12½
¾	63½	54	¾	33	17½
1 to 1½	65½	56	1 to 2	39	23
2 to 3	66½	57			

Lap Weld, extra strong, plain ends

2	59	49½	2	34	18½
2½ to 4	62½	53	2½ to 4	39	25
4½ to 6	62	52½	4½ to 6	38	24
7 to 8	54	47	7 & 8	36	22
9 and 10	51½	40½	9 to 12	26	13½
11 and 12	50½	39½			

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2⅛ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—4¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	48	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb. 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes
Cold-Drawn

1 in.	61	2 in.	46
1¼ to 1½ in.	53	2¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

Rails

	Per Gross Ton
Standard, f.o.b. mill	$40.00
Light (from billets), f.o.b. mill	30.00
Light (from rail steel, f.o.b. mill)	26.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16 in. and large	$2.40
Spikes, ½-in. and large	2.40
Spikes, boat and barge	2.60
Tie plates, steel	1.75
Angle bars	2.55
Track bolts, to steam railroads	3.50
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	Per Cent Off List
Machine bolts	75
Carriage bolts	75
Lag bolts	75
Plow bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagons	75
C.p.c. and t. square or hex nuts, blank or tapped	75
Washers*	.7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	75
Semi-finished hexagon castellated nuts, S.A.E.	75
Stove bolts in packages, P'gh	75, 25 and 10
Stove bolts in packages, Ch'go	75, 25 and 10
Stove bolts in pkgs., Cleveland	75, 25 and 10
Stove bolts in bulk, P'gh	80
Stove bolts in bulk, Chicago	80
Stove bolts in bulk, Cleveland	80
Tire bolts	60 and 10

Discounts of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per Lb.
F.o.b. Pittsburgh or Cleveland	$2.25
F.o.b. Chicago	2.35

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

Discounts to Jobbers

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	80 and 25
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread, ⅝ in. and smaller	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	80, 25 and 10
Upset set screws, sq. head, 1 in. dia. and smaller	75, 10 and 10
Upset set screws, 1⅛ in. and larger	75 and 10
Milled studs	70

SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. to 6-in., inclusive Pittsburgh	$26.00
Rerolling, 4-in. to 6-in., inclusive, Youngstown	26.00
Rerolling, 4-in. to 6-in., inclusive, Cleveland	26.00
Rerolling, 4-in. to 6-in., inclusive, Chicago	26.00
Forging quality, Pittsburgh	31.00
Forging quality, Youngstown	31.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

Slabs

(3 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

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Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00 to $37.00
Cleveland	35.00 to 37.00
Chicago	36.00 to 38.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$1.75 to $2.00
Furnace, f.o.b. Connellsville Prompt	2.50 to 4.25
Foundry, by-product, Chicago ovens, for delivery outside switching districts	7.00
Foundry, by-product, delivered in Chicago switching district	7.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	7.82
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b. ovens	8.00
Foundry, by-products, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.00 to $1.15
Mine run coking coal, f.o.b. W. Pa.	1.10 to 1.25
Gas coal, ¾-in., f.o.b. Pa. mines	1.25 to 1.40
Mine run gas coal, f.o.b. Pa. mines	1.20 to 1.30
Steam slack, f.o.b. W. Pa. mines	0.25 to 0.35
Gas slack,, f.o.b. W. Pa. mines	0.35 to 0.45

Fuel Oil

Per Gal f.o.b. Bayonne, N. J.

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago

No. 2 industrial fuel oil	2.80c. to 2.90c.
No. 5 industrial fuel oil	2.45c. to 2.50c.

Per Gal. f.o.b. Cleveland

No. 3 distillate	5.25c.
No. 4 industrial	4.75c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works: High-heat Duty Brick	Intermediate Duty Brick
Penn.	$35.00	$25.00 to $30.00
Maryland	35.00	25.00 to 30.00
New Jer.	$44.00 to 57.00	
Ohio	35.00	25.00 to 30.00
Kentucky	35.00	25.00 to 30.00
Missouri	35.00	30.00
Illinois	35.00	25.00 to 30.00
Ground fire clay, per ton	6.50	

Chrome Brick

	Per Net Ton
Standard size	$42.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	$61.50
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.90

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$40.40 to $41.40
4-in., del'd Chicago	43.40 to 44.40
6-in., and larger, del'd New York	35.30
4-in., del'd New York	38.30
6-in., and larger, Birm'ham	33.00
4-in., Birmingham	36.00

Class "A" and gas pipe, $3 extra.

Pig Iron, Ores, Ferroalloys

VALLEY

Per Gross ton, f.o.b. Valley furnace:

Basic	$13.50
Bessemer	15.00
Gray Forge	14.50
No. 2 foundry	14.50
No. 3 foundry	14.00
Malleable	$14.50 to 15.00
Low phos., copper free	23.00 to 25.00

Freight rate to Pittsburgh or Cleveland district, $1.89.

PITTSBURGH

Per Gross ton, f.o.b. Pittsburgh district furnace:

Basic	$14.00
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.00

Freight rates to points in Pittsburgh district range from 69c. to $1.26.

CHICAGO

Per gross ton at Chicago furnace:

N'th'n No. 2 fdy.	$15.50
N'th'n No. 1 fdy.	16.00
Malleable, not over 2.26 sil.	15.50
High phosphorus	15.50
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	16.14
Low phos., sil. 1 to 2, Copper free	25.00
Silvery, sil. 8 per cent	23.67
Bess. ferrosil'n, 15 per cent	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
Northern No. 2 fdy., del'd St. Louis	$18.30 to 18.80
Southern No. 2 fdy. del'd.	14.56
Northern malleable, del'd.	18.30 to 18.80
Northern basic, del'd.	18.30 to 18.80

Freight rates $3c. (average) Granite City to St. Louis; $2.30 from Chicago; $4.56 from Birmingham.

NEW YORK

Per gross ton, delivered New York district:

* Buffalo, No. 2, del'd east N. J.	$17.41 to $17.66
East Pa. No. 2 fdy.	14.02
East Pa. No. 2 fdy.	14.52

Freight rates: $1.52 to $2.63 from eastern Pennsylvania.

* Prices delivered to New Jersey cities having rate of $3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:

No. 2 fdy	$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	15.50
Lake Superior charcoal, del'd.	23.41

CINCINNATI

Per gross ton, del'vered Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$13.82
Ala. fdy., sil. 2.25 to 2.75	14.32
Tenn. fdy., sil. 1.75 to 2.25	13.82
N'th'n No. 2 foundry	$17.01 to 17.59
S'th'n Ohio silvery, 8%	21.02

Freight rates, $2.02 from Ironton and Jackson, Ohio; $3.82 from Birmingham.

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n No. 2 fdy. (local delivery)	$15.00
S'th'n fdy. sil. 1.75 to 2.25	16.14
Malleable (local delivery)	15.00
Ohio silvery, 8 per cent	21.87
Stand. low. phos., Valley	23.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 63c. average local switching charge; $3.12 from Jackson, Ohio; $6.14 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

East. Pa. No. 2	$13.34 to $13.84
East. Pa. No. 2X	13.84 to 14.34
East. Pa. No. 1X	14.34 to 14.84
Basic (del'd east. Pa.)	13.50 to 14.00
Malleable	14.74 to 18.01
Stand. low phos. (f.o.b. east. Pa. furnace)	20.00 to 21.00
Cop. b'r'g low phos. (f.o.b. furnace)	20.00 to 21.00
Va. No. 2	21.79
Va. No. 2X	22.29

Prices, except as specified otherwise, are delv'd Philadelphia. Freight rates: 84c. to $1.79 from eastern Pennsylvania furnaces; $4.67 from Virginia furnaces.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:

No. 2 fdy., 1.75 to 2.25 sil.	$11.00
No. 2 soft, 2.25 to 2.75 sil.	11.50
Basic	11.00

CANADA

Per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.75	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	$23.00 to 23.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$68.00
Foreign, 80%, Atlantic or Gulf port, duty paid	68.00

Prices for lots of one carload or more; extras applied on less than carload lots.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$24.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads)	31.00
14% to 16% (less carloads)	36.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$18.00	14%	$23.50
11%	21.00	15%	24.00
12%	21.50	16%	25.00
13%	22.50	17%	26.50

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$18.00	12%	$20.50
7%	18.50	13%	21.50
8%	18.75	14%	22.50
9%	19.00	15%	23.00
10%	19.50	16%	24.00
11%	20.00	17%	25.50

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	94c.
Ferrotungsten, less carloads	$1.00
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c to 20.50c.
Ferrovanadium, del., per lb. contained Va.	$2.60 to $2.80
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton with $2 unitage	30.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	45.00
Ferromolybdenum, per lb. Mo., del.	90c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$26.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c. to 8.50c.
Iron, low phos., Swedish, average 68½% iron	9c.
Iron, basic or foundry, Swedish, average 65% iron	8c.
Iron, basic or foundry, Russian, aver. 63% iron (nom.)	9c.
Manganese, Caucasian, washed 52%	*23c.
Manganese, African, Indian, 50-52%	*21c. to 22c.
Manganese, Brazilian, 46 to 48%	*13c.

	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid	$10.00

	Per Gross Ton
Tungsten, domestic scheelite	$8.00 to $10.00
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic seaboard	16.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic seaboard	18.00

* Quotations nominal in absence of sales.

Fluorspar

	Per Net Ton
Domestic, washed gravel 85-5, f.o.b. Kentucky and Illinois mines	$9.00 to $10.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	12.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	$16.00 to 16.75
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$8.00 to $8.50
No. 2 heavy melting steel	7.00 to 7.50
No. 2 railroad wrought	8.00 to 8.50
Scrap rails	8.00 to 8.50
Rails 3 ft. and under	10.00 to 10.50
Sheet bar crops, ordinary	9.00 to 9.50
Compressed sheet steel	8.00 to 8.50
Hand bundled sheet steel	7.00 to 7.50
Hvy. steel axle turnings	7.00 to 7.50
Machine shop turnings	6.25 to 6.75
Short shov. steel turnings	6.25 to 6.75
Short mixed borings and turnings	5.50 to 6.00
Cast iron borings	5.50 to 6.00
Cast iron carwheels	8.00 to 8.50
Heavy breakable cast	8.00 to 8.50
No. 1 cast	8.50 to 9.50
Railr. knuckles and couplers	9.00 to 9.50
Rail, coil and leaf springs	9.00 to 9.50
Rolled steel wheels	9.00 to 9.50
Low phos. billet crops	10.50 to 11.00
Low phos. sheet bar crops	10.50 to 11.00
Low phos. plate scrap	9.50 to 10.00
Low phos. punchings	10.00 to 10.50
Steel car axles	11.00 to 11.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$5.00 to $5.50
Shoveling steel	5.00 to 5.50
Frogs, switches and guards	$5.00 to $5.50
Hydraulic comp. sheets	3.75 to 4.00
Drop forge flashings	4.00 to 4.50
No. 1 busheling	3.50 to 4.00
Rolled carwheels	6.75 to 7.25
Railroad tires	8.00 to 8.50
Railroad leaf springs	7.75 to 8.25
Axle turnings	4.50 to 5.00
Steel couplers and knuckles	7.00 to 7.50
Coil springs	8.25 to 8.75
Axle turnings (elec fur.)	5.50 to 6.00
Low phos. punchings	8.00 to 8.50
Low phos. plates, 12 in. and under	8.00 to 8.50
Cast iron borings	3.00 to 3.50
Short shoveling turnings	3.25 to 3.75
Machine shop turnings	3.00 to 3.50
Rerolling rails	7.50 to 8.00
Steel rails, less than 3 ft.	8.25 to 8.75
Steel rails, less than 2 ft.	8.75 to 9.25
Angle bars, steel	7.00 to 7.50
Cast iron carwheels	7.75 to 8.25
Railroad malleable	5.50 to 6.00
Agricultural malleable	5.00 to 5.50
* Relaying rails, 56 to 60 lb.	15.00 to 17.00
* R-lay rails, 65 lb. and up	18.00 to 23.00

Per Net Ton

Iron angle and splice bars	$5.00 to $5.50
Iron arch bars, transoms	5.00 to 5.50
Iron car axles	11.00 to 11.50
Steel car axles	9.00 to 9.50
No. 1 railroad wrought	4.50 to 5.00
No. 2 railroad wrought	4.50 to 5.00
No. 1 busheling	2.50 to 3.00

No. 2 busheling	$2.00 to	$2.50
Locomotive tires, smooth	7.50 to	8.50
Pipe and flues	1.25 to	1.75
No. 1 machinery cast	6.25 to	6.75
Clean automotive cast	7.25 to	7.75
No. 1 railroad cast	5.75 to	6.25
No. 1 agricultural cast	5.75 to	6.25
Stove plate	5.50 to	6.00
Grate bars	6.25 to	6.75
Brake shoes	6.00 to	6.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$6.50 to	$7.00
No. 2 heavy melting steel	5.00 to	5.50
No. 1 railroad wrought	7.50 to	8.00
Bundled sheets	4.00 to	4.50
Hydraulic compressed, new	5.50 to	6.00
Hydraulic compressed, old	4.00 to	4.50
Machine shop turnings	3.50 to	4.00
Heavy axle turnings	5.50 to	6.00
Cast borings	3.50 to	3.75
Heavy breakable cast	....	8.00
Stove plate (steel works)	6.00 to	6.50
No. 1 low phos. heavy	10.00 to	10.50
Couplers and knuckles	8.00 to	8.50
Rolled steel wheels	8.00 to	8.50
No. 1 blast furnace	3.50 to	3.75
Spec. iron and steel pipe	6.50 to	7.00
Shafting	12.00 to	13.00
Steel axles	12.00 to	13.00
No. 1 forge fire	5.50 to	6.00
Cast iron carwheels	8.00 to	8.50
No. 1 cast	8.00 to	9.00
Cast borings (chem.)	8.00 to	10.00
Steel rails for rolling	9.00 to	9.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$7.00 to	$7.25
No. 2 heavy melting steel	6.25 to	6.50
Compressed sheet steel	6.00 to	6.50
Light bundled sheet stampings	4.00 to	4.50
Drop forge flashings	5.25 to	5.75
Machine shop turnings	3.25 to	3.50
Short shoveling turnings	4.00 to	4.50
No. 1 busheling	5.25 to	5.50
Steel axle turnings	5.00 to	5.50
Low phos., billet crops	10.00 to	11.00
Cast iron borings	3.75 to	4.00
Mixed borings and short turnings	3.75 to	4.00
No. 2 busheling	3.75 to	4.00
No. 1 cast	7.50 to	8.00
Railroad grate bars	5.00 to	5.50
Stove plate	5.00 to	5.50
Rails under 3 ft.	8.50 to	9.00
Rails for rolling	8.50 to	9.00
Railroad malleable	6.75 to	7.00
Cast iron carwheels		8.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel		$7.25
No. 2 heavy melting scrap	$6.00 to	6.50
Scrap rails	6.00 to	6.50
New hydraul. comp. sheets	6.00 to	6.50
Old hydraul. comp. sheets		5.00
Drop forge flashings	6.00 to	6.50
No. 1 busheling	6.00 to	6.50
Hvy. steel axle turnings		6.00
Machine shop turnings	4.00 to	4.50
Knuckles and couplers		9.00
Coil and leaf springs		9.00
Rolled steel wheels		9.00
Low phos. billet crops	9.00 to	9.50
Short shov. steel turnings	5.50 to	6.00
Short mixed borings and turnings	3.75 to	4.25
Cast iron borings	3.75 to	4.25
No. 2 busheling	3.50 to	4.00
Steel car axles	10.00 to	11.00
Iron axles	10.00 to	11.00
No. 1 machinery cast	9.50 to	10.00
No. 1 cupola cast	8.50 to	9.00
Stove plate	7.00 to	7.50
Steel rails, 3 ft. and under	9.25 to	9.75
Cast iron carwheels	8.00 to	9.00
Industrial malleable	7.00 to	7.50
Railroad malleable	7.00 to	7.50
Chemical borings	7.50 to	8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$7.50 to	$8.00
Scrap steel rails	8.00 to	8.50
Short shoveling turnings		4.00
Stove plate		6.00
Steel axles		9.00
Iron axles		9.00
No. 1 railroad wrought	4.50 to	5.00
Rails for rolling	8.00 to	8.50
No. 1 cast		8.50
Tramcar wheels		8.50
Cast iron borings, chem.		8.50

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$5.50 to	$6.00
No. 1 heavy melting	5.00 to	5.50
No. 2 heavy melting	4.75 to	5.25
No. 1 locomotive tires	5.00 to	5.50
Misc. stand-sec. rails	5.25 to	5.75
Railroad springs	6.00 to	6.50
Bundled sheets	2.00 to	2.50
No. 2 railroad wrought	5.00 to	5.50
No. 1 busheling	3.50 to	4.00
Cast iron borings and shoveling turnings	2.75 to	3.25
Iron rails	7.00 to	7.50
Rails for rolling	6.75 to	7.25
Machine shop turnings	2.00 to	2.50
Heavy turnings	3.00 to	3.50
Steel car axles	8.50 to	9.00
Iron car axles	11.00 to	11.50
Wrot. iron bars and trans.	4.00 to	4.50
No. 1 railroad wrought	3.50 to	4.00
Steel rails less than 3 ft.	7.00 to	7.50
Steel angle bars	6.00 to	6.50

Cast iron carwheels	$5.00 to	$5.50
No. 1 machinery cast	6.50 to	7.00
Railroad malleable	4.00 to	4.50
No. 1 railroad cast	6.25 to	6.75
Stove plate	6.00 to	6.50
Relay, rails, 60 lb. and under	16.00 to	16.50
Relay, rails, 60 lb. and over	20.00 to	21.00
Agricult. malleable	4.00 to	4.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$3.50 to	$5.00
No. 2 heavy melting steel		3.50
Heavy melting steel (yard)		1.50
No. 1 hvy. breakable cast	5.00 to	5.25
Stove plate (steel works)	2.50 to	2.90
Machine shop turnings	0.75 to	1.25
Short shoveling turnings	0.75 to	1.25
Cast borings	0.50 to	1.00
No. 1 blast furnace	0.50 to	1.00
Steel car axles	8.00 to	8.50
Spec. iron and steel pipe	2.50 to	2.75
Forge fire	2.75 to	3.00
No. 1 railroad wrought	4.00 to	4.50
No. 1 yard wrought long	3.25 to	3.50
Rails for rolling	5.00 to	5.50
No. 1 cast		4.50
No. 2 cast		4.50

Stove plate (foundry)		$4.50
Malleable cast (railroad)	$4.00 to	4.50
Cast borings (chemical)	6.00 to	6.50

Per gross ton, delivered local foundries:

No. 1 machinery cast		$9.00
No. 1 hvy. cast (cupola size)	7.50 to	8.00
No. 2 cast	4.00 to	4.50

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$5.00 to	$5.50
Scrap rails for melting	6.00 to	6.50
Loose sheet clippings	1.00 to	1.50
Bundled sheets	3.75 to	4.25
Cast iron borings	3.00 to	3.50
Machine shop turnings	3.00 to	3.50
No. 1 busheling	4.50 to	5.00
No. 2 busheling	2.75 to	3.25
Rails for rolling	6.50 to	7.00
No. 1 locomotive tires	7.00 to	7.50
Short rails	9.00 to	9.50
Cast iron carwheels	6.50 to	7.00
No. 1 machinery cast	6.50 to	7.00
No. 1 railroad cast	6.00 to	6.50
Burnt cast	4.25 to	4.75
Stove plate	4.25 to	4.75
Agricultural malleable	6.75 to	7.25
Railroad malleable	7.00 to	7.50

DETROIT

Dealers' buying prices per gross ton:

Hvy. melting steel	$4.50 to	$5.00
Borings and short turnings	2.25 to	2.75
Long turnings	1.75 to	2.25
No. 1 machinery cast	7.75 to	8.25
Automotive cast	8.00 to	8.50
Hydraul. comp. sheets	4.00 to	4.50
Stove plate	3.00 to	3.50
New No. 1 busheling	3.50 to	4.00
Old No. 2 busheling	1.50 to	2.00
Sheet clippings	1.25 to	1.75
Flashings	2.75 to	3.25

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	12.50	10.00
Stove plate	10.00	8.00
Standard carwheels	10.00	8.50
Malleable	10.00	8.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.	
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	2.95c.
Squares and flats	3.45c.
Hoops and bands, under ¼ in.	2.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.65c.
Hot-rolled sheets (No. 10)	2.90c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	$3.74
Spikes, large	2.40c.
Small	2.65c. to 2.80c.
Rust	2.90c.
Track bolts, all sizes, per 100 count, 70 per cent off list.	
Machine bolts, 100 count, 70 per cent off list.	
Carriage bolts, 100 count, 70 per cents off list.	
Nuts, all styles, 100 count, 70 per cent off list.	
Large rivets, base per 100 lb.	$3.08
Wire, black, soft ann'l'd, base per 100 lb.	2.75
Wire, galv. soft, base per 100 lb.	3.20
Common wire nails, per keg	2.35
Cement coated nails, per keg	2.35

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

CHICAGO

Base per Lb.	
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforc. bars, billet steel	1.35c to 1.40c.
Rail steel reinforment	1.15c. to 1.25c.
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.00c.
Flats and squared	3.50c.
Bands, 3/16 in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.45c.
Galv. sheets (No. 24)	3.75c.
Hot-rolled sheets (No. 10)	2.75c.
Spikes (3/16 in. and lighter)	3.45c.
Track bolts	4.30c.
Rivets, structural	3.75c.
Rivets, boiler	3.75c.

Per Cent Off List	
Machine bolts	65
Carriage bolts	65
Coach and lag screws	65
Hot-pressed nuts, sq., tap. or blank	65
Hot-pressed nuts, hex., tap. or blank	65
Hex. head cap screws	80 and 10
Cup point set screws	75 and 10
Flat head bright wood screws	52½ and 10
Spring cotters	60
Stove bolts	80
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

NEW YORK

Base per Lb.	
Plates and struc. shapes	3.10c.
Soft steel bars, small shapes	3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	6.00c. to 6.50c
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.54c.
Flats and squares	4.04c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.30c.
Bands	3.30c.
Hot-rolled sheets (No. 10)	3.00c.
Hot-rolled ann'l'd sheets (No. 24*)	3.50c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	4.50c.
Standard tool steel	12.00c.
Wire, black annealed (No. 10)	3.65c.
Wire, galv. annealed (No. 10)	4.05c.
Tire steel ½ x ⅝ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Common wire nails, base, per keg	$2.60

Per Cent Off List	
Machine bolts, cut thread:	
¾ x 6 in. and smaler	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65 to 65 and 10
¾ x 20 in. and smaller	65 to 65 and 10

Per 100 Ft.	
Boiler Tubes:	
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.35c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.00c.
Hot-rolled sheets (No. 10) up to and inc. 48 in. wide	3.00c.
over 48 in. wide	3.15c.
Black corrug. sheets (No. 24)	3.75c.
Gal. corrug. sheets	4.05c.
Structural rivets	4.00c.
Boiler rivets	4.00c.

Per Cent Off List	
Tank rivets, 7/16 in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	65
Less than 200 lb.	55
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	65
Less than 200 lb.	55

PHILADELPHIA

Base per Lb.	
*Plates, ¼-in. and heavier	2.45c.
*Structural shapes	2.45c.
*Soft steel bars, small shapes, iron bars (except bands)	2.45c.
Reinforc. steel bars, sq., twisted and deform.	2.35c.
Cold-finished steel bars	3.25c.
*Steel hoops	3.00c.
*Steel bands, No. 12 to 3/16 in., incl.	2.75c.
Spring steel	5.00c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	3.75c.
*Hot-rolled annealed sheets (No. 10)	2.90c.
Diam. pat. floor plates, ¼ in.	5.00c.
Swedish iron bars	5.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deductions on orders aggregating 4000 lb. or over.

CLEVELAND

Base per Lb.	
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex.	2.95c.
Cold-fin. flats and sq.	3.45c.
Flat rolled steel under ¼ in.	3.00c.
Cold-finished strip	3.55c.
Hot-rolled annealed sheets (No 24)	3.25c.
Galvanized sheets (No. 24)	3.75c.
Hot-rolled sheets (No. 10)	3.00c.
Black ann'l'd wire, per 100 lb.	$2.75
No. 9 galv. wire, per 100 lb.	3.20
Com. wire nails, base per keg	2.35

*Net base, including boring and cutting to length.

CINCINNATI

Base per Lb.	
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinfore. bars	3.00c.
Rails steel reinfore. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex.	3.32c.
Squares and flats	3.82c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot-rolled sheets (No. 10)	3.50c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 40 kegs)	2.45
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.25
Chain, per 100 lb.	10.25

Net per 100 Ft.	
Seamless steel boiler tubes, 2-in.	$15.87
4-in.	34.57
Lap-welded steel boiler tubes, 2-in.	15.12
4-in.	32.96

BUFFALO

Base per Lb.	
Plates and struc. shapes	3.20c.
Soft steel bars	2.95c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.50c.
Rounds and hex.	3.00c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.05c.
Bands	3.30c.
Hoops	3.95c.
Hot-rolled sheets (No. 10)	3.45c.
Com. wire nails, base per keg	$2.60
Black wire, base per 100 lb.	3.25

BOSTON

Per Lb.	
*Beams, channels, angles, tees, zees	3.00c.
*H beams and shapes	3.00c.
*Plates—sheared, tank, and univ. mill, ¼ in. thick and heavier	3.00c.
Floor plates, diamond pattern	5.25c.
*Bar and bar shapes (mild steel)	2.90c.
*Bands 3/16 in. thick and No. 12 ga. incl.	3.40c.
Hoops, No. 14 ga. and lighter	4.90c. to 5.40c.
*Half rounds, hf. ovals, ovals and bevels	4.15c.
Tire steel, rd. edge 1½ x ½ in. and larger	4.50c.
Smaller sizes	4.75c.
Cold-finished rounds and hexagons	3.60c.
Cold-rolled strip steel	5.20c.
Cold-finished squares and flats	4.10c.
*Blue annealed sheets No. 10 ga.	3.15c.
One pass cold-rolled sheets No. 24 ga.	3.50c.
Blued stove pipe sheets No. 24 ga.	3.90c.
Galvanized steel sheets No. 24 ga.	4.00c.
Lead coated (long ternes) No. 24 ga.	5.00c.

*Base prices for 15,000 lb. orders, extras apply for smaller quantities.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates and struc. shapes, ¼-in. and heavier	3.15c.	3.30c.	3.00c.
Soft steel bars	3.15c.	3.30c.	3.00c.
Reinforcing bars	3.00c.	3.00c.	3.00c.
Hot-rolled annealed sheets No. 24)	3.90c.	4.20c.	4.50c.
Hot-rolled sheets (No. 10)	3.75c.	3.50c.	4.00c.
Galv. sheets (No. 24)	4.55c.	4.50c.	5.00c.
*Struc. rivets, ½ in. and larger, less than 100 lb.	5.75c.	5.00c.	4.00c.
*Cold finished steel Rounds	5.50c.	5.50c.	4.50c.
Squares and hexagons	6.75c.	6.75c.	5.75c.
Flats	7.25c.	7.25c.	6.75c.
Nails—base per keg less carload:			
Com. 4-60d	$2.40	$2.40	$2.40
S. Box 4-20d	2.40	2.40	2.40
Finish 6 & 8d	2.40	2.40	2.40
All others	2.65	2.65	2.65

*Subject to deductions for quantity.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Quartermaster Supply Office, Army Base, Brooklyn, asks bids until Jan. 31 for one air compressor, one bronze propeller, hardware, tools, switches and other equipment (Circular 86).

Jacob Adler, 785 Humboldt Street, Brooklyn, is planning to rebuild metal works and smelting plant, damaged by fire several weeks ago. Cost over $25,000 with equipment. Laspia & Samenfeld, 217 Havemeyer Street, are architects.

Tubular Service Corpn., Brooklyn, has been organized by Charles R. Mumford, 120 Forty-fourth Street, and associates, to manufacture steel and metal tubing and allied products.

Third Avenue Railway Co., 2396 Third Avenue, New York, has filed plans for one-story power substation, 50 x 60 ft., at 500 West Eighty-sixth Street. Cost about $35,000 with equipment. J. Edward King is company architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 31 for quantity of electric cable (Schedule 9488), and one tractor (Schedule 9495) for New York Navy Yard.

Board of Transportation, 250 Hudson Street, New York, is arranging fund of $1,462,925 for extension of Eighth Avenue subway system to Brooklyn and Queens and in Bronx, about $500,000 of amount noted for purchase of equipment and parts. During 1933, board plans total appropriation of $59,280,565 for extensions and improvements in subway lines, of which over $500,000 will be used for purchase of mechanical, electrical and miscellaneous equipment and spare parts. Philip E. Pfeifer is general manager.

Conviser & Callahan Corpn., Queens, L. I., has been organized by Samuel and Matthew H. Conviser, 118-80 Metropolitan Avenue, Queens, to manufacture oil burners, heaters and kindred equipment.

Michel Brewing Corpn., 122 Third Street, Brooklyn, has plans for an addition to steam power house. Cost about $22,000 with equipment. Alfred H. Eccles, 1 Bridge Plaza, Long Island City, is architect and engineer.

Estellite Co., 476 Broome Street, New York, manufacturer of electric lighting fixtures and electric novelties, has leased 10,000 sq. ft. floor space in building at 574-6 Broadway for new plant, and will remove to new location.

North Shore Daily Journal, 135-12 Northern Boulevard, Flushing, L. I., will soon begin superstructure for two-story and basement addition to printing and publishing plant. Cost about $250,000 with equipment. Lockwood-Greene Engineers, Inc., 100 East Forty-second Street, New York, is architect and engineer.

Air Cruisers, Inc., 64 Lakeview Avenue, Clifton, N. J., manufacturer of aircraft accessories and equipment, has leased about 21,000 sq. ft. additional floor space in adjoining building for expansion.

Grimm Foundry Co., Inc., Bridgewater, N. J., care of Charles D. Smith, Millstone, N. J., recently organized by Mr. Smith and Edward F. Meyer, Finderne, N. J., capital $150,000, plans operation of foundry for production of iron and other metal castings.

Richmond Radiator Co., 1480 Broadway, New York, manufacturer of radiators and other heating equipment, has leased one-story building, 15,000 sq. ft. floor space at 574 Ferry Street, Newark, for new assembling, storage and distributing plant. Branch works at Port Newark, Newark, will be removed to new location. Main plant is at Uniontown, Pa.

International Edge Tool Co., Inc., 43 South Sixth Street, Newark, has advanced production schedule for number of new products, in addition to regular line of butchers' knives and other cutting equipment, including meat-choppers, grinding cutters, sinew extractors, etc.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 31 for one cylinder grinding machine honing type (Schedule 9496) for Philadelphia Navy Yard.

Philadelphia Gas Works Co., 1401 Arch Street, Philadelphia, is planning expansion and improvements, including installation of turbine-driven gas-pumping machinery and accessories, gas engine-driven air compressors and other mechanical equipment at different plants, new main steel pipe lines, 30, 20 and 16-in. diameter, and smaller. Cost over $450,000.

Philadelphia Commercial Body Co., 2532 North Broad Street, Philadelphia, manufacturer of automobile bodies, has leased 10,400 sq. ft. in building at Seventeenth and Callowhill Streets for new plant.

Delaware Electric Power Co., Wilmington, Del., has arranged fund of $635,794 for extensions and improvements in plants and system during 1933; of this amount about $286,000 will be used for gas plants, steel pipe line extensions and other gas distributing facilities, and approximately $138,170 for electric plants, transmission and distributing lines.

Shifman Brothers, 1 Mott Street, Newark, manufacturers of mattresses, springs, etc., have purchased former plant of Kelsey-Hayes Wheel Corpn., 1700 Elmwood Avenue, Buffalo, three stories, 190 x 250 ft., and will remodel for new factory.

Syracuse Chilled Die Foundry Co., Inc., Syracuse, N. Y., has been organized by Gregory F. and James J. Fay, 1044 Bellevue Avenue, to manufacture dies, castings, etc.

Remington-Rand, Inc., 465 Washington Street, Buffalo, manufacturer of office equipment, typewriters, accounting machines, etc., has organized Canadian subsidiary under name of Remington-Rand, Ltd., to take over operations in Canada. New company will enlarge facilities at Toronto, and will also operate factories at Niagara Falls and Ottawa, Ont.

CENTRAL DISTRICT

McDowell & Co., 861 Western Avenue, Pittsburgh, manufacturers of iron and steel pipe, etc., plan expansion and modernization at different plants. Cost over $150,000 with equipment.

Erie County Electric Co., Twelfth and French Streets, Erie, Pa., has arranged fund of $131,147 for expansion and improvements in power plants, substations, transmission and distributing lines, and other structures.

Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, has applied for permission to construct a transmission line across Allegheny River on steel towers from Springdale Borough to Plum Township.

Greensburg Baking Co., Greensburg, Pa., plans rebuilding baking plant, with traveling ovens, conveyors and other mechanical equipment, recently destroyed by fire. Loss about $125,000 with machinery.

Tri-State Brewing Co., 411 Yuster Building, Columbus, Ohio, Edward Prior, president, has plans for new three and five-story plant in South side district, with power house, refrigerating plant, bottling works and other mechanical departments. Cost over $400,000 with equipment. Harry Roderick and Floyd Freeman, Beggs Building, Columbus, are architects.

Thompson Spring Corpn., Akron, Ohio, care of Bruce W. Pierce, 2200 First Central Trust Building, has been organized by Robert S. Dechant and associates to manufacture steel springs and equipment.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Feb. 1 for three dynamometer torque load indicating scales (Circular 333); until Feb. 7, 11 geared trolleys and five plain trolleys (Circular 331); until Feb. 8, one sheet metal brake and one foot power squaring shear (Circular 334); until Feb. 13, 102 hand inertia starter assemblies (Circular 328).

Soeder Sons Milk Co., 3801 Payne Avenue, Cleveland, let general contract to John Zuck, 833 Helmesdale Road, for addition to power house, 39 x 94 ft.

Stumpf Brothers, 3225 South Meridian Street, Indianapolis, meat packers, are planning to rebuild part of plant recently destroyed by fire. Loss about $30,000 with equipment.

Electro Control Co., Inc., Goshen, Ind., has been organized by William Craig and William Hendrix, Goshen, and associates, to manufacture electrical controls and other electrical equipment.

American Utilities Securities Corpn., 824 Continental Bank Building, Indianapolis, plans hydroelectric power development on Eel River, Owen County, including power dam, generating station, switching and power stations, and transmission lines. Cost over $1,400,000.

City Council, Albion, Mich., has plans for a municipal electric light and power plant and distributing system. Cost over $100,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

Hayes Body Corpn., Grand Rapids, Mich., manufacturer of automobile bodies, has advanced production schedule and is now employing largest working force than for past 18 months.

Ideal Furnace Co., Milan, Mich., has been organized by Jesse B. Button, 16226 Princeton Avenue, Detroit, and associates, capital $500,000, to manufacture furnaces, boilers and other heating equipment, ventilating and cooling apparatus and parts.

Checker Cab Mfg. Corpn., Kalamazoo, Mich., manufacturer of taxicabs and parts, has resumed operations following curtailment of several weeks, reinstating about 500 men.

Mount Clemens Brewing Co., Mount Clemens, Mich., has work under way on plant extensions and improvements, to include additional equipment. Cost close to $40,000. Leonard Freiman is one of heads of company.

Leonard Refrigerator Co., Grand Rapids, Mich., manufacturer of refrigerators and equipment, has increased production schedule and is now giving employment to about 850 men.

SOUTH CENTRAL

United States Engineer Office, Mobile, Ala., asks bids until Feb. 14 for construction of two steel barges, 100 x 24 x 7 ft. (Circular 270).

Baton Rouge Electrical & Machine Works, 523 Third Street, Baton Rouge, La., plans rebuilding part of plant recently damaged by fire.

State Board of Education, War Memorial Building, Nashville, Tenn., has plans for hangar with repair and reconditioning shop at Sky Harbor Air Field, near Murfreesboro, Tenn. Cost over $30,000 with equipment. Marr & Holman, Stahlman Building, Nashville, are architects.

Phoenix Naval Stores Co., Gulfport, Miss., has acquired former plant of Yaryan Reduction Co., and will improve for production of turpentine, pine oil, rosin and kindred naval stores, with capacity of about 50 tons a day. Later expansion will be carried out to double capacity. R. F. Anderson is head.

Tennessee-Eastman Corpn., Kingsport, Tenn., has superstructure under way on two additions to cellulose rayon mill, seven and eight-stories, in connection with plant expansion and improvement. Company also plans new pumping plant. Entire program will cost about $2,000,000 with equipment. Company is affiliated with Eastman Kodak Co., Rochester, N. Y.

SOUTH ATLANTIC

Jewell Ridge Coal Co., Tazewell, Va., plans new steam power house at coal properties near Richlands, Va. Cost over $85,000 with equipment.

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 8 for wire rope, steel and copper wire, corrugated roofing, eyebolts, nails, spikes, hydraulic lifts, railroad switchstands, chain shackles, welding rods, journal jacks, pressure gages and other equipment (Schedule 2834).

Gray & Stevens, Inc., St. Augustine, Fla., has been organized by A. C. Gray and A. F. Stevens, St. Augustine, to manufacture machinery and parts.

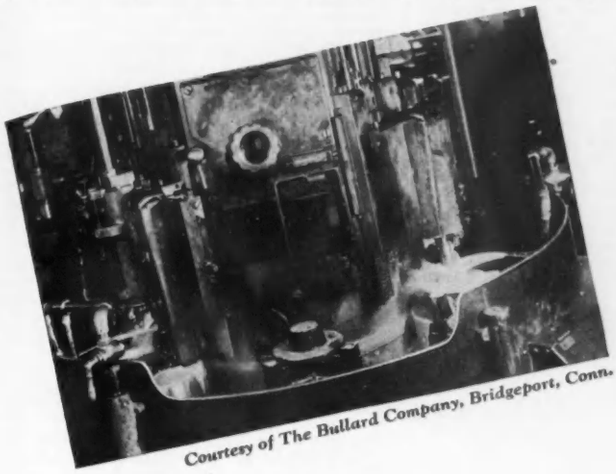
Lynchburg Foundry Co., Lynchburg, Va., has increased operations for production of plows and kindred agricultural equipment, adopting full time basis with working force of about 150 men.

United States Coast Guard Headquarters, Washington, asks bids until Feb. 21 for steel water tank and tower, pumping plant, pipe line and other equipment at Port Orford Coast Guard Station, Port Orford, Ore.

Pure Ice Co., 524 Twentieth Street, Huntington, W. Va., plans one-story electric-operated ice-manufacturing plant. Cost $70,000 with machinery.

Southern Cotton Oil Co., Rocky Mount, N. C., plans to rebuild one-story structure at cottonseed oil mill, recently destroyed by fire. Loss about $30,000 with equipment. Headquarters are in Canal Bank Building, New Orleans.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 31



Courtesy of The Bullard Company, Bridgeport, Conn.

OPERATION: TURNING COMPANION FLANGE.
MACHINE: BULLARD MULT-AU-MATIC.
MATERIAL: STEEL FORGING.
SPEED: 78 FEET PER MINUTE.
DEPTH OF CUT: 3/16 INCH.
FEED: .018 INCH.
LUBRICANT: 1 PART SUNOCO TO 20 PARTS WATER.

Courtesy of Carborundum Company, Niagara Falls, N. Y.

OPERATION: GRINDING STEEL ROLL. 9 IN. DIAMETER, 18 IN. LONG.
MACHINE: LANDIS ROLL GRINDER, 12 IN. X 72 IN.
SCLEROSCOPE: 94 TO 101.
WHEEL SPEED: 1700 R. P. M.
WORK SPEED: 40 R. P. M.
COOLANT: 1 PART SUNOCO TO 30 PARTS WATER.

ACCURACY MAINTAINED *with* LONG RUNS BETWEEN TOOL GRINDS

The increasing necessity for lower production costs places upon Machine Shop Executives the obligation of selecting cutting lubricants of known quality and proven worth.

Economical operation and profit are dependent upon continuous machine tool performance.

The service that Sunoco Emulsifying Cutting Oil renders many leaders in the metal cutting industry in reducing the cost of production is at your disposal for operations in your plant.

Increased machine speed, longer runs per tool grind, less lost time for resetting, reduced tool maintenance, greater accuracy and better finish are the reasons for the increasing use of Sunoco by the automotive industry, nut and bolt industry, gear manufacturers and steel plants.

Sunoco protects the finished work from rust and corrosion, it will not separate and is hygienic.

We invite your correspondence and cordially offer you the assistance of our experienced Cutting Oil Engineers.

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Akron, Albany, Allentown, Altantic City, Baltimore, Battle Creek, Beaumont, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Detroit, Flint, Grand Rapids, Harrisburg, Jackson (Mich.), Jacksonville, Miami, Montreal, Newark, New York, Philadelphia, Pittsburgh, Providence, Reading, Rochester, Scranton-Wilkes Barre, Syracuse, Tampa, Toledo, Toronto, Trenton, Tulsa, Wilmington, Youngstown and London, England.

for one motor-driven engine lathe (Schedule 9491) for Pensacola, Fla., Nevy Yard; one battery charging equipment for storage battery trucks (Schedule 9498) for Sewell's Point, Va., Navy Yard; steel rivets and washers (Schedule 9465), barrel bolts, wire rope clips, screw eyes, etc. (Schedule 9467) for Eastern and Western yards; until Feb. 7, machine and wood screws (Schedule 9474), four motor-driven bench planers and jointers, four variety circular saws (Schedule 9502), brass and steel bolts and nuts (Schedule 9477), one platform scale, two bench scales nad four hanging dial scales (Schedule 9493), steel bolts and nuts, and lag screws (Schedule 9466) for Eastern and Western yards; 3000 releasing pistols, 1050 releasing pistol washers, 6000 shear pins and 500 releasing bolts (Schedule 9500) for Yorktown, Va., Navy Yard; 36,000 lb. flat sheet steel, 20,000 lb. black flat steel, 398,300 lb. cold rolled sheet steel (Schedule 9476) for Norfolk and Mare Island yards; until Feb. 14, four electric portable bench grinders, four electric portable drill presses, four electric portable scaling hammers (Schedule 9503) for Eastern and Western yards.

Glover Machine Co., Atlanta Street, Marietta, Ga., is considering erection of one-story machine shop. Cost about $20,000 with equipment. J. W. Glover is head.

City Council, Martinsburg, W. Va., plans erection of a municipal electric light and power plant. Cost over $75,000 with equipment.

NEW ENGLAND

Town Board of Education, Ludlow, Mass., is considering manual training department in new high school. Cost over $125,000. Plans being drawn by Robert B. Warner, 129 Ingersoll Grove, Springfield, Mass., architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 7 for one motor-driven thermo-plastic molding press (Schedule 9499) for Portsmouth, N. H., Navy Yard.

Antique Wood Products Corpn., 101 Park Avenue, New York, has leased plant of Bantam Ball Bearing Co., Litchfield, Conn., idle for about four years, with option to purchase, and will remodel for new factory. Employment will be given to about 100 persons.

Repress Aeronautical Engineering Corpn., Cranston, R. I., has been organized by William C. Waring, Jr., Warwick, R. I., and Ronald B. Smith, Caldwell, R. I., capital $250,000, to manufacture aircraft equipment.

Town Council, Naugatuck, Conn., plans installation of pumping machinery, pipe lines and other equipment in proposed sewage disposal plant on Naugatuck River, where site has been secured. Cost about $130,000 with machinery.

Goldstein-Poland Co., Inc., Providence, R. I., has been organized by J. P. Goldstein and James J. Poland, 257 Niagara Street, to manufacture metal plated jewelry and novelties.

MIDDLE WEST

United States Engineer Office, First District, Chicago, asks bids until Feb. 3 for metal hand railings for locks at Brandon Roads, Lockport, Dresden Island, Starved Rock and Marseilles, Ill., in Illinois River (Circular 110).

Boss Bolt & Nut Co., 3403 West Forty-seventh Street, Chicago, has changed its name to Lock Nut Corpn. of America, Inc.

Davenport Locomotive & Mfg. Corpn., Davenport, Iowa, manufacturer of industrial locomotives parts, etc., is considering rebuilding one-story storage and distributing shop recently destroyed by fire. Loss about $30,000 with equipment.

Best Brewing Co., 1417 Fletcher Street, Chicago, is planning plant expansion and modernization, including new bottling works, refrigerating department and other divisions. Cost about $350,000 with equipment.

Aluminum Train Co., 6319 Kenwood Avenue, Chicago, has been organized by Roy C. Jacobson and T. G. Lively, to manufacture aluminum and other metal toy trains, tracks, etc.

Nebraska Power Co., Omaha, Neb., is planning expansion and improvements in transmission lines. Cost about $300,000 with equipment. Early feature of program is transmission line to Florence pumping station, to cost about $75,000 of sum noted.

Standard Oil Co., Pueblo, Colo., has plans for bulk oil storage and distributing plant at East Fourteenth Street and Erie Avenue. Cost about $55,000 with equipment. A. W. Beaver is local manager.

Common Council, Farragut, Iowa, contemplates erection of a municipal electric light and power plant. Cost over $75,000 with equipment.

SOUTHWEST

Bell Oil & Gas Co., Kennedy Building, Tulsa, Okla., plans extensions and improvements in oil refinery at Grandfield, Okla., including additional equipment for gasoline production to increase capacity for crude oil handling from 30,000 to 50,000 bbl. a month. Addition will be built to oil skimming plant, with extensions in pipe lines. Cost about $100,000 with equipment.

Universal-Atlas Cement Co., 208 South La Salle Street, Chicago, is resuming operations at mill at Hannibal, Mo., closed for several months, with employment of about 450 men.

Oklahoma Gas & Electric Co., Oklahoma City, Okla., is planning expansion and improvements in transmission and distributing lines, power substations and other structures, also construction of new transmission lines. Cost over $85,000.

Common Council, Burlington, Kan., has plans for erection of a municipal electric light and power plant. Cost over $90,000 with equipment. E. T. Archer, New England Building, Kansas City, Mo., is engineer.

Wylie-Stewart Machinery Co., Noble Street, Oklahoma City, Okla., is considering installation of additional equipment for production of sheet metal building products.

East Texas Packing Co., Longview, Tex., meat packer, has awarded general contract to T. S. Moss, Dallas, Tex., for new one-story plant. Cost about $35,000 with equipment.

Board of Education, Dallas, Tex., plans manual training department in new multi-story junior high school, for which bids have been asked on general contract. Cost about $250,000.

Hyman Ginsbery, Tyler, Tex., is at head of project to erect an oil refinery at Artex, near Texarkana, Tex., where property has been acquired. Initial unit will cost over $85,000 with equipment. Company will be organized to carry out project.

PACIFIC COAST

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Feb. 1 for motor-driven gasoline pumps, gasoline storage tanks, transformers and other electrical equipment, power and telephone manholes, etc. (Specification 7161), non-climbable and field wire fencing (Specification 7032); until Feb. 15, one-story balloon hangar, 89 x 131 ft. x 70 ft. high (Specification 7027) for Sunnyvale, Cal., naval air station; bids (no closing date yet stated) for three 500-hp. watertube boilers, oil-burning units, soot blowers, de-aerating feedwater heater, boiler feed pumps and accessory boiler equipment, improvements in piping system, etc. (Specification 7171) for naval operating base, San Diego, Cal.

Western Canning Co., Ltd., Chico, Cal., has awarded general contract to Harry Schuster Co., Ltd., 354 Hobart Street, Oakland, Cal., for new one-story canning plant, 50 x 400 ft. Cost about $60,000 with machinery. Willis Lowe, 1056 Hubert Road, Oakland, is architect.

Board of City Trustees, Alameda, Cal. (not Alhambra, Cal., as recently incorrectly stated in these columns), has report from Burns-McDonnell-Smith Engineering Corpn., Western Pacific Building, Los Angeles, consulting engineer, for proposed municipal electric light and power plant, recommending 15,000 steam turbo-generating station. Cost about $1,000,000 with equipment. Alternate proposition submitted for Diesel engine-generating station to cost about $1,343,500.

United States Gypsum Co., 300 West Adams Street, Chicago, has plans for a new plant at Midlands, Cal. Cost over $100,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 7 for motor-driven turret lathe and equipment (Schedule 9482), one motor-driven cutting machine (Schedule 9481) for San Pedro, Cal., Navy Yard; one time signal transmitting device (Schedule 9492), two electric furnaces (Schedule 9487), 4500 multiple folding rules (Schedule 9484) for Mare Island Navy Yard.

Public Works Officer, Army Air Field, Ford Island, Honolulu, T. H., is planning to rebuild airplane hangar, with repair and reconditioning shop, recently destroyed by fire. Loss over $100,000 with equipment.

FOREIGN

Yahagi Power Co., Tokyo, Japan, is organizing Yanagi Nitrogenous Fertilizer Co., a subsidiary, with capital of 3,300,000 yen (about $681,800) to erect new plant near Nagoya, Japan, for production of nitric acid and sulphate of ammonia. Cost over $350,000 with machinery.

Downs, Coulter & Co., Ltd., Bradford, England, manufacturer of rayon and other textile products, is securing site near Toronto, for Canadian branch mill, including power house, machine shop and other mechanical departments. Canadian subsidiary is being organized to carry out project. Cost about $500,000 with machinery.

Oji Paper Mfg. Co., Fuji Paper Mfg. Co., and Karafuto Industrial Co., Tokyo, Japan, all large paper manufacturers, are arranging for merger of interests, effective about Feb. 1, with capital of 149,000,000 yen (about $30,879,400). Consolidated company plans expansion for production of newsprint and other paper stock.

Trade Notes

Mills Co., Wayside Road at Nickel Plate R. R., Cleveland, manufacturer of metal partition, has appointed San Angelo Building Materials Co, 808 Western Reserve Life Building, San Angelo, Tex., as its sales representative in central Texas.

Tuthill Spring Co., 760 Polk Street, Chicago, is distributing its all-metal resilient highway guard through the following organizations: Joseph S. Potts, Jr., & Co., Travelers Building, Richmond, Va.; R. B. Gress, P. O. Box 504, Little Rock, Ark.; Browning-Ferris Machinery Co., 205 Exposition Avenue, Dallas, Tex.; C. H. Jones Co., 134 Pierpont Avenue, Salt Lake City, Utah; Robert T. Twedt Co., Fifteenth and Pioneer Streets, Cheyenne, Wyo.; Orleans Materials & Equipment Co., 213 Pan American Building, New Orleans (for Louisiana, Mississippi and Alabama); D. C. Elphinstone, Inc., 115 South Calvert Street, Baltimore (for Maryland and Delaware).

Babcock & Wilcox Tube Co., Beaver Falls, Pa., has opened an office at 2002 Philtower Building, Tulsa, Okla., in charge of Carl J. Hochenauer.

Williamsport Wire Rope Co., Williamsport, Pa., has been added to the list of wire rope manufacturers licensed to manufacture preformed wire rope under the American Cable Co.'s patents.

Kelly-Decker Co., 39 Cortlandt Street, New York, coke and foundry supplies, has changed its name to Kelly-Bates Co.

New Trade Publications

Packing.—Garlock Packing Co., Palmyra, N. Y.—Handsomely bound 157-page catalog, containing liberal text, recommendation tables and other information relating to the company's line of mechanical packing materials; also section devoted to engineering data.

Wrought Iron Pipe.—A. M. Byers Co., Pittsburgh. Principles and practice of bending wrought iron pipe are interestingly presented in 12-page brochure, which also discusses the company's special wrought iron bending pipe adaptable where reduced flow resistance and reduced number of couplings are desirable.

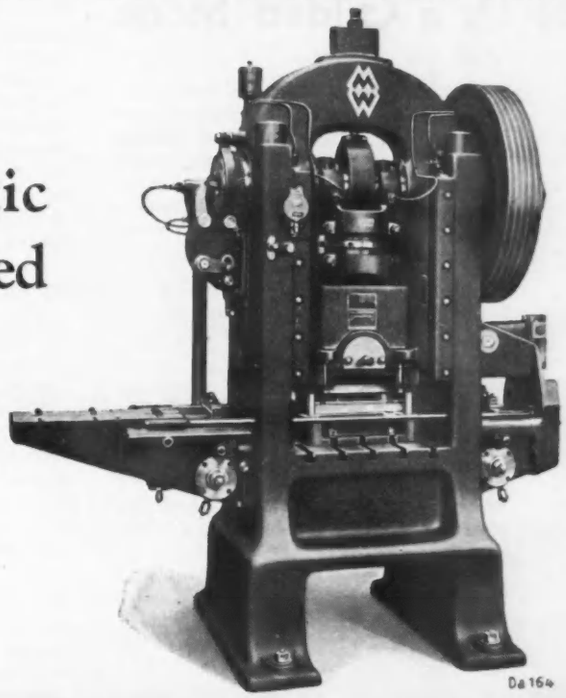
Pig Iron.—Chateaugay Ore & Iron Co., 26 Liberty Street, New York. Illustrated booklet, 31 pages, describes composition and applications of Chateaugay copper free low phosphorus pig iron.

Steel Sheet Piling.—Carnegie Steel Co., Pittsburgh. Insert B, for inclusion in company's manual covering steel sheet piling, contains condensed and rearranged translations of German publications dealing with methods of determining bending moments, as developed by Dr. H. Blum, and with earth pressures, as developed by Dr. Ing. H. Krey.

Belt Conveyors.—Robins Conveying Belt Co., 15 Park Row, New York. Bulletin 82, 99 pages, contains tables and charts for determining capacity, speed, width, power and belt-ply of belt conveyors. Includes illustrations of belt conveyors used in many industries.

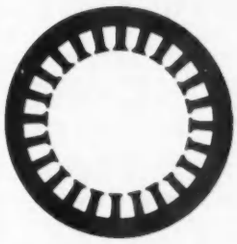
The recently established tentative national standard for abbreviations for the most common scientific and technical terms is being published by the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York. Other organizations engaged in this activity, under the procedure of the American Standards Association, are the American Association for the Advancement of Science, American Institute of Electrical Engineers, American Society of Civil Engineers and the Association for the Promotion of Engineering Education.

Automatic
High Speed
Press



With
Precision
Grip-Feed

SCHATZ



The Important Features in the Automatic High Speed Press Are—

Longest possible life for the tools and machine.

Absolute accuracy of feed by sliding grips.

High reliable operating speed.

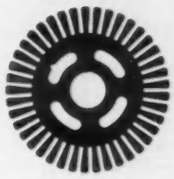
Unique construction of frame, ram and long guides entirely eliminates shearing of tool edges.

Reliable and efficient friction disc clutch.

Built in sizes of 35, 55, 90, 140 and 220 tons capacity.

The Precision Grip-Feed, single or double-ended, is also available on our Open Front and Inclinable Presses as small as 11 tons pressure.

Literature available on request.



THE SCHATZ MANUFACTURING CO.
POUGHKEEPSIE, N.Y.
"UNUSUAL MACHINE TOOLS"

Technocracy Offers Us a Gilded Stone

(Concluded from Page 161)

dreds of years to build it, but it is the only kind of an economic and social machine that ever worked. It has given us so comparatively little trouble, prior to 1930, that we have never been obliged to study its "innards" and their workings as thoroughly as we should have. It is getting intensive study now.

Overproduction Not at Fault

Already we know that overproduction is not our trouble, in spite of the statements of the technocrats. The average rate of increase in basic production from 1924 to 1929 was only about 2½ per cent per year as compared with a base of 1923, 1924 and 1925. The rate of increase in steel production began to flatten out as far back as 1918. Industrial production cannot be projected upward into the future in straight lines, as the Technocrats assume, for experience in every mature industry has recorded an S-shaped curve which flattens out as the saturation point is approached.

Even if we were overproduced in 1929, we are sadly underproduced now. The 15 per cent operating rate in the steel industry, for example, is barely enough to make up for rust, depreciation and obsolescence. So far as technological progress during the past two years is concerned, the tremendous decrease in capital investment equipment means that industry has virtually stood still in this respect.

Our problem is indeed not that of overproduction, but that of underconsumption.

Capital Created by Production

Where is the money to come from to finance consumption, assuming that capital, management and labor were to reach an accord in this matter of the distribution of wealth? It cannot come at this time from a redistribution of non-existent profits. It cannot come from Uncle Sam's strong box, for that is already pretty well obligated to the emergency needs of American business and American banks. There are but two sources from which additional mass buying power can be had. One is by making a strenuous effort to secure efficiency gains and time savings which will offset and make up for our past losses. The other is to lighten the non-productive load on the machine.

Let us examine these two approaches to the restoration of prosperity because herein, I believe, lie the things that need adjustment in our use of the machine.

Our wealth in this country is very largely a machine-made product. It is built upon time savings converted into dollar savings.

We have lost a great deal of wealth during the past three years of enforced idleness of men and machines. The present efforts to reestablish confidence and start business going, necessary as they are, represent merely the application of the starter to the car of business and industry. If it is to get up speed again it must do so under its own power.

Modernization Will Make Up Depression Losses

Fortunately we have a good deal of slack that we can take up in the matter of our industrial efficiency. Our machine, refined as it is compared with the mechanization of other countries, can still be vastly improved. For it is a fact that over 50 per cent of the productive tools of American industry are now obsolete. In other words, because of the possible time saving and dollar saving, it would pay handsomely in wealth increments if we could scrap this 50 per cent of inferior machinery and replace it by modern equipment.

This is what we call modernization, and such modernization, intelligently applied, would quickly make up for the losses that we have experienced.

Invention and improvement, which are the essentials of modernization, have been put to work before in America to make up for depression losses under similar conditions. Successfully, too, even in the face of price declines.

During the period of 30 years following our Civil War, the average of commodity prices declined almost uninterruptedly. During the same period of receding prices we increased our annual output of manufactured products four times in dollar volume, eight times in actual volume, and multiplied the annual industrial wages paid by almost four.

Consciously or unconsciously our ancestors of that period chose the one effective way to build prosperity in the face of price declines. They put improved machinery to work in American industry on such a scale as not merely to compensate for the declining prices but to make increasing profits out of them and to pay increased wages in spite of them. For real wages—measured in purchasing power—doubled during this period of shrinking prices. Thus prosperity was coaxed back in two ways, by decreasing the cost of products to the consumer and by increasing his average purchasing power through increases in real wages. No other result was possible from this except the ensuing multiplication of business volume and the diversification of industry.

Trying to increase our sum total of wealth without increasing our efficiency gains and time savings is like trying to lift ourselves by our boot straps.

Before we say that the old gray mare of mechanization which has pulled our prosperity cart so many years so faithfully is not as good as she used to be, we should examine the load that has been placed in her cart; the non-productive load, which contributes little or nothing to our use of the machine or which positively acts as a brake upon it—such things as overcapitalization, speculation, graft, government interference in business, excessive taxation, and ever mounting government cost.

We were not content with having the old gray mare increase her speed safely and gradually year after year. Instead of that, we stimulated her with the hypodermic of inflation, and then placed bets on her, through the agency of the stock market, that she would double her speed every six months. We expected the impossible to happen, and we got it—but it was not what we expected!

We erected a huge roulette wheel on the back of the machine so that we could gamble with and for the wealth increments that its honest work produced. We labeled this "the stock market" and professed its purpose to be the legitimate financing of mechanization and business. We transformed this into the most stupendous gambling hell that the world has ever seen, and one in which the fruits of the machine were dissipated in speculation instead of being distributed in sound consumption-developing channels.

A Change of Heart More Important Than a Plan

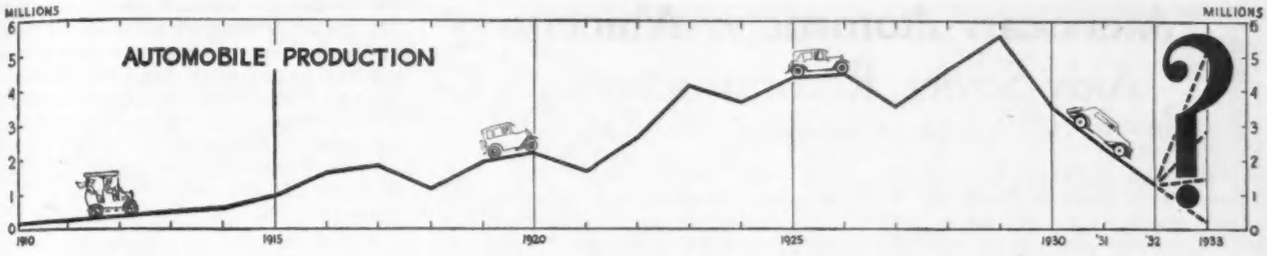
Society cannot be reformed through mechanistic panaceas. It must come from motivation. Selfishness and greed cannot be eliminated by the manipulation of gears, pinions and kilowatts. It must come from a change of heart.

That change of heart is being brought about today. There is not a man or woman in this room who is not far more charitably disposed toward his fellow man than he or she was three years ago, or who is not more ready to help his unfortunate brother in distress. We are humble today, whereas three years ago we were proud.

That, my friends is the first big step toward recovery. The leaven is at work.

There is more nourishment for great and small in the Sermon on the Mount than in Technocracy's materialistic gilded stone.

The corrosion resistance of stainless steels, nickels and nickel alloys, tin plate and certain bronzes has been established by an investigation made at Iowa State College, Ames, Iowa, for the American Bottlers of Carbonated Beverages. The results have been compiled in a pamphlet published by the association, of which Junior Owens, 726 Bond Building, Washington, is secretary.



Growing Auto Scrap Heaps Will Bring NEW SALES

FOR three years automobile production has been declining. Depression conditions and depression psychology have combined to reduce the number of new car purchases, while wear and tear continue to take their toll.

In 1932 approximately 1,436,000 cars and trucks were produced in the United States and Canada, while fully 3,000,000 cars went to the scrap heap or were removed from use. Registrations at the end of 1932 are estimated at 24,270,000 compared with 26,500,000 in 1930.

Fully two-thirds of the cars now in use were built before 1930. More than 20 per cent are over seven years old . . . the estimated average life of a car. From 1923 to 1929 the average output was 4,400,000 units annually. Large outputs are indicated as the cars now in use are replaced. Nothing has happened to change man's desire for motor cars. His buying power alone has been altered.

When the curtain of depression begins to lift one of the very first industries to reflect improvement will be that of the motor car. A huge accumulated demand will await filling. Making up that deficiency will lay a heavy responsibility upon the iron foundries.

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Automotive castings require material of exacting specifications. With its wide range of raw materials, its technical and service staffs devoted to these problems, the Interlake Iron Corporation has kept pace with the constantly changing demands of this industry.

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American Automatic Machinery Aids Soviet Reconstruction

(Concluded from Page 164)

of which are on the outside of the drums. This lathe is designed for spindle speeds up to 1500 r.p.m., and has anti-friction bearings throughout.

The pistons are approximately 6½ in. in diameter and 8 in. long, and are made of cast iron. The first-operation machine, Fig. 5, of the battery of three, will rough and finish bore, rough and finish face the open end, and center the closed, or head, end. It is equipped with a special air chuck designed to locate the piston true with the core, and thus assure uniform wall thickness; it also has an automatic center drilling device. All tools are of No. 3 stellite, except the centering tool, which is of high-speed steel.

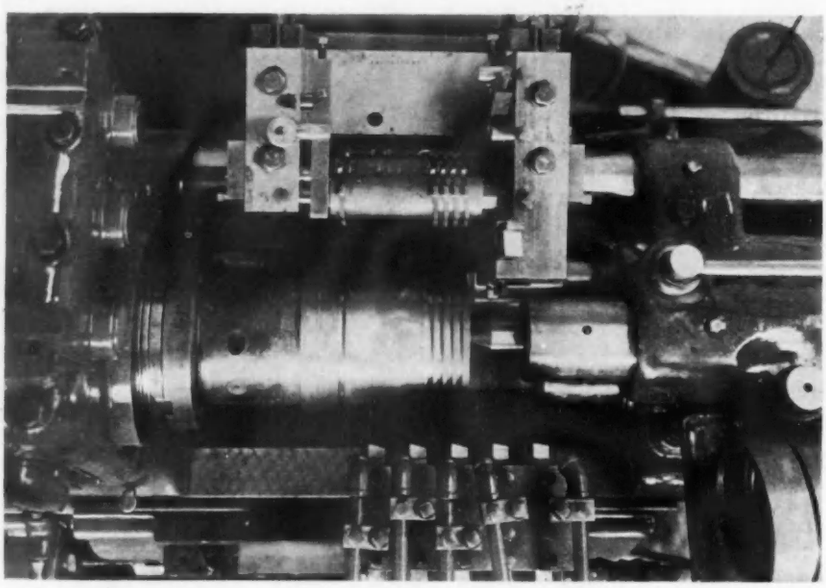

FIG. 7.—In the third operation on the piston knife-blade cutters semi-finish the sides and finish the bottom of the grooves, while the carriage tools finish-turn the outside diameter. After the tools have completed their cuts, the hob-type cutters on the back arm finish the grooves to final size.

The second 12-in. Fay, Fig. 6, is tooled for rough-turning, rough-facing and rough-grooving the piston. There are five grooves. As in similar set-ups supplied for American plants, the piston is supported in the open end by a pilot engaging a straight hole, locating against the face. On the closed end it is supported by the revolving tailstock center. Balanced drive is obtained through the wristpin bosses. Carriage turning tools and the back arm facing tool are of stellite; the back arm rough-grooving tools are of high-speed steel.

Accurate Ring Grooves Obtained

The open end of the piston is rebored in a separate operation after the rough turning on the Fay. The reboring removes any out-of-roundness caused by the distortion of the piston castings due to the removal of stock and scale in the roughing operation. This is essential in order to obtain accurate ring grooves on the finishing operation.

Finish-turning, finish-facing, semi-finishing and finishing of the ring grooves, chamfering and oil grooving are done on the third Fay lathe, tooled as shown in Fig. 7. Knife-blade cutters mounted in an auxiliary attachment under the back arm semi-finish the sides of the grooves and finish the bottom of them while the carriage tools finish-turn the outside diameter. Hob-type cutters on the back arm finish the ring grooves to final size, after the other tools have completed their cuts. These cutters permit holding the width of the ring grooves to 0.001 in.

The carriage turning tools and the back arm facing tool are of stellite; the semi-finish grooving tools mounted on the auxiliary attachment and the hob-type finish grooving tools are of high-speed steel. On the second and third operations the piston is turned and faced at a high spindle speed consistent with the use of stellite. Hourly production on the first, second, and third operation is 72, 16 and 16 pieces, respectively.

In addition to the parts named above, Fay lathes have been supplied for machining the following parts at the Cheliabinsk plant: Final drive pinion, camshaft gear, clutch collar, two-step gear, upper transmission shaft, sprocket gear, outer and inner clutch drums, track roller hub, single and double flange track rollers, transmission gears, sliding gears, bevel pinion shaft, bevel gear shaft, bevel gear, track link bushing, and final drive hub.

This order for 47 machines is one of several equipment orders placed in the United States for Cheliabinsk, aggregate purchases being understood to total approximately $2,000,000, mostly for machine tools.

Steel Castings Orders Gained in November

WASHINGTON, Jan. 20—Making a gain of 1339 tons, orders for commercial steel castings last November were 13,235 tons compared with 11,896 tons in October, according to reports received by the Bureau of the Census from 130 establishments. The November bookings consisted of 2918 tons of railroad specialties and 10,317 tons of miscellaneous castings. Orders in the first 11 months of 1932 totaled 144,317 tons compared with 372,796 tons in the corresponding period of 1931. The 1932 bookings consisted of 32,139 tons of railroad specialties and 112,178 tons of miscellaneous castings.

The output last November increased 1181 tons to 13,712 tons from 12,531 tons in October. Of the November production, 3672 tons was railroad specialties and 9914 tons was miscellaneous castings. Production in the first 11 months of 1932 totaled 163,826 tons compared with 415,188 tons in the corresponding period of 1931. The production in 1932 consisted of 36,468 tons of railroad specialties and 127,358 tons of miscellaneous castings.

East Liverpool Company Enters Stoker Field

The Patterson Foundry & Machine Co., East Liverpool, Ohio, has entered the stoker field and will build several types of stokers from the smallest domestic size to very large industrial sizes. Rounding out its line of equipment for combustion and heating industries, the company will furnish steam jet ash conveyors, ash storage tanks and soot blowers, conditioned air heating systems, air conditioners and oil burning equipment. Several district representatives have been appointed by the stoker division to handle the stokers, ash conveyors and storage tanks and soot blowers. These include the Homer-Read Co., 105 Vandergrift Building, Pittsburgh, for the Pittsburgh territory; Horace S. Bracken, Johnstown, Pa., the Johnstown territory, and R. W. Matthews, 770 Girard Street, N. W., Washington, the District of Columbia.

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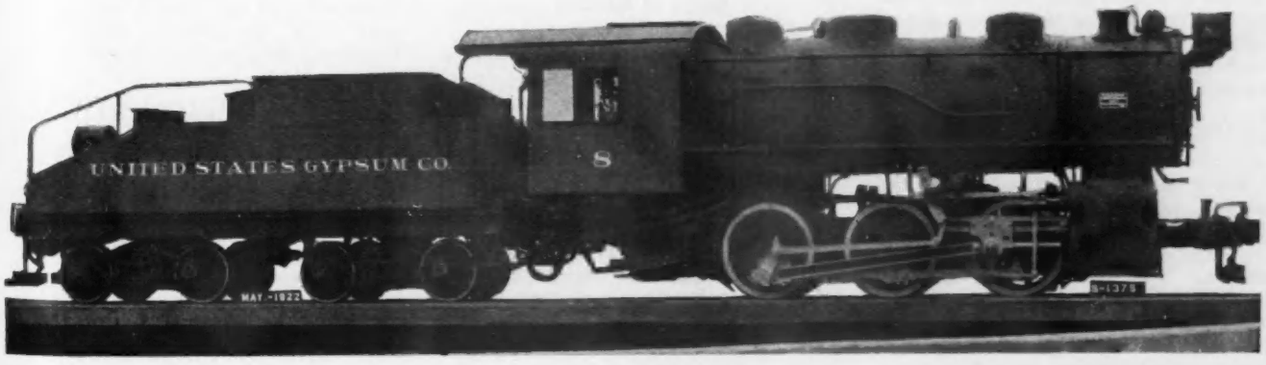

Practical Methods for Heating Solids by Induction

(Concluded from Page 165)

for annealing or other purposes, may be classified in respect to shape as:

1. Solid round billets.
2. Solid square or rectangular billets.
3. Rods, round or square, in diameter 1 in. or under.
4. Drawn wire of all sizes up to about ¼ in. or under.
5. Sheet metal in strip which is to be heated by continuous travel through the heating device.
6. Sheet metal, usually of large area, which must be heated in batches by a discontinuous process.
7. Round tubes of all sizes and lengths and wall thicknesses and tubes of square, rectangular, oval or other cross-section.
8. Masses of metal of various sizes and irregular shapes.

It is obvious that, if inductive processes of heating are to be used, the methods and devices required will vary in many respects. Yet all of the various sizes and shapes of metal listed above may be heated advantageously by making use, one way or another, of the principle of inductive heating.

Inductive methods of heating which may be employed commercially fall broadly into three general classes:

a. Those methods in which the heating is wholly by direct induction, by which we mean that the alternating current in an inductor develops an alternating magnetic field which acts directly on the susceptor, heating it and nothing else.
b. Those methods in which the materials to be heated are placed in a muffle, the muffle walls only being heated by induction.
c. Combination methods in which part of the heating of the susceptor is by direct induction and the remainder by heat radiated to it from the walls of a specially contrived inductively heated muffle.

If proper use be made of any or all of the three general methods listed, I hope to show convincingly that all non-ferrous non-magnetic and many magnetic ferrous metals having any of the forms listed above may be heated using induction, to a temperature as high as commercial requirements impose and, indeed, with better control of temperature, more uniformity in temperature and with higher economy than can be obtained by the methods now in extensive use in which fuel or electricity is employed.

Cases Suitable for Treatment by Direct Induction

When use of the direct inductive method is contemplated, the availability of reasonably priced frequency changing equipment first deserves attention. The tonnage to be handled in the heating of billets and tubes must be sufficient to justify the installation of a motor-driven generator to supply current at a frequency of not less than 500 to 1000 cycles per second and in special cases as high as 5000 cycles. Current of normal frequency, 25 to 60 cycles, is not generally applicable where direct induction methods are used, and the temperatures required exceed the temperature at which magnetism is lost.

The second consideration is technical, in that the resistivity and the least dimension of a transverse section of a solid susceptor, as a billet, be such that the greater portion of the electromagnetic energy which flows into it becomes changed into heat.

Finally the susceptor must have a geometrical symmetry which will allow it to be placed easily within an inductor coil and in a manner to permit of a close and uniform physical coupling at all points along the greatest length of the susceptor. Billets of round or rectangular section, pipes or large diameter tubing meet these conditions while the crankshaft of an automobile engine does not.

Coupling and Its Importance

The importance of close coupling may be shown by reference to the courve Fig. 2. Here the curve shows the increase in overall efficiency of the heater as the coupling is varied from 0 to 1. A coupling 0 means that the diameter of the inductor is infinitely greater than the diameter of the susceptor. A coupling 1.0 means that the inductor is wound tight on the susceptor. The curve has been drawn from both experimental data and from calculations.

The calculations and results show the high importance from the standpoint of obtaining good efficiency for maintaining a close coupling.

In addition to this reason for making the coupling close is the economic advantage of getting the highest possible power factor as measured at the inductor terminals. The higher the power factor the less becomes the cost of correcting it with static condensers to give unity power factor at the generator terminals.

Speed of Heating

No other known method can compare with the direct induction method for rapidly heating any considerable mass of conducting matter. The fundamental reason for this is that any heat which enters a mass placed in a hot chamber must enter that mass chiefly in the form of radiant heat through its surface.

Radiant heat is a form of electromagnetic energy no different, except as to wave length, from that which leaves an inductor coil which is carrying alternating current.

The radiant heat energy is a radiation produced by a frequency of the order of 6×10^{13} cycles per second. Hence when this radiant heat energy falls upon the surface of a metal from which it is but little reflected, it is all converted into heat energy in the time it has penetrated below the surface only by 5×10^{-5} mm. or less. The heat so produced can go further into the mass by the process of heat conduction only, which is exceedingly slow in masses of moderately low thermal conductivity. On the contrary, when direct induction methods are used and a moderate frequency of say 1000 cycles per second is employed, the conversion of the electromagnetic energy into heat in this case takes place, in large part, well below the surface, a centimeter or two, and, by proper choice of frequency, as far below as may be desired.

What limit then must we set in the speed of heating of any conducting mass? The answer is: With a sufficiently large source of high-frequency power available, and with a correctly designed and water-cooled inductor, the speed of heating, even a large mass, is in principle without limit.

In a particular case tried by me, a 1-in. diameter steel rod 4 in. long was made to absorb 60 kw. and it came from room temperature to a forging temperature in 2 or 3 sec. With still more power at one's disposal, this rod might have been heated as if struck by a hammer of electrical energy. This feature of inductive heating may find in the future numerous useful applications.

(To be concluded)

Fabricated Plate Orders Lower in November

WASHINGTON, Jan. 20.—Fabricated steel plate orders last November totaled 7168 tons, according to reports received by the Bureau of the Census from 51 plants. Orders in October totaled 16,737 tons. The November bookings included 5625 tons of miscellaneous requirements and 1181 tons of material for oil storage tanks.

Bookings in 11 months of 1932 aggregated 151,592 tons compared with 286,067 tons in the corresponding period of 1931. The 1932 orders in net tons were distributed as follows: Oil storage tanks, 35,563; refinery materials and equipment, 4929; tank cars, 251; gas holders, 7302; blast furnaces, 436; miscellaneous, 103,111.

General Motors to Use B-D Descaling Process

License to use the Bullard-Dunn process for electrolytically descaling metal has been granted the General Motors Corpn., by the Bullard Co., Bridgeport, Conn. It covers use of the process in all General Motors' plants and was executed after tests in both the Cadillac plant at Detroit and in the research division of the corporation.